WESTERN GAS

IN LEADERSHIP THERE IS SAFETY

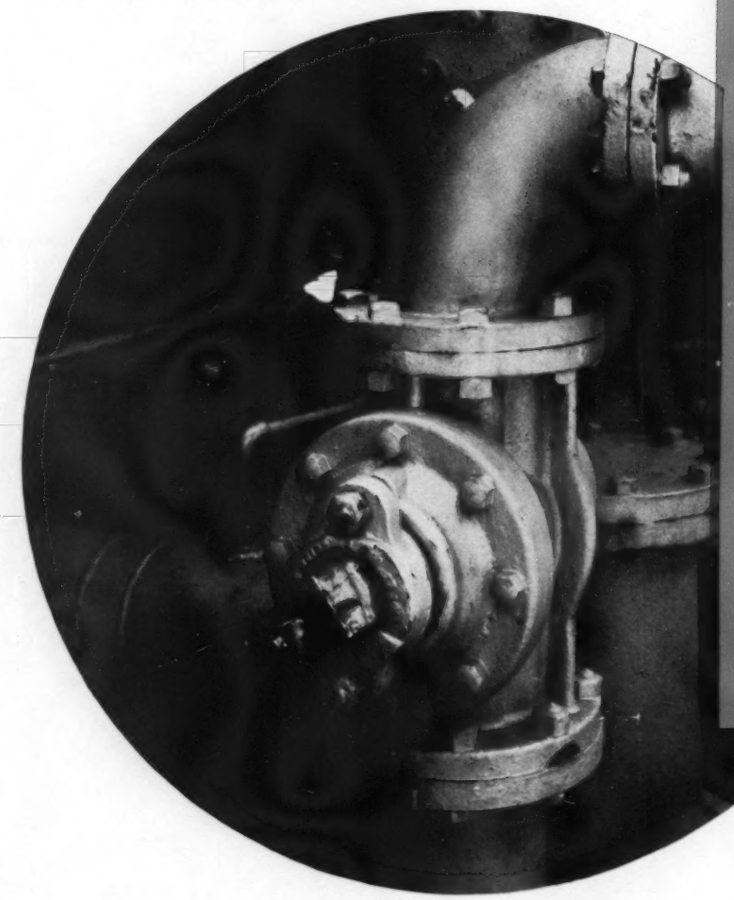
Experienced Gas Industry Executives and Engineers—those who have learned through first-hand experience after leaving the university and those who have learned in the "University of Hard Knocks"—have come to know the true meaning of the **Reynolds** trade mark. Grounded in tradition, this mark of highest quality in Gas Control Devices has lighted the way for accurate control . . . more dependable regulators . . . real factory co-operation.

More than just typifying mechanical perfection, the name **Reynolds** symbolizes a manufacturer who understands the needs of the Gas Industry. It is a sign of smart judgment to standardize on **Reynolds** Gas Control Equipment.

REYNOLDS GAS REGULATOR CO. ANDERSON, INDIANA. U. S. A.

An historic installation! One of the first group of Nordstrom Lubricated Plug Valves ever installed by the gas industry.

Photo of Nordstrom Lubricated Valve installed 15 years ago on outlet of high pressure holder supplying city distribution main in a California city. No repairs to date. In constant use.



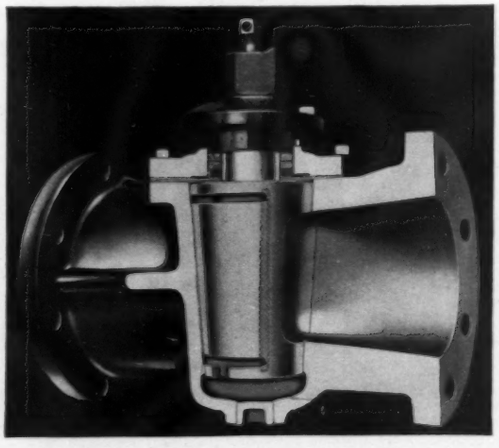
IN SERVICE 15 YEARS

and no repairs to date

NOT A SINGLE PENNY SPENT FOR REPAIRS OR SERVICE

As a result of the performance of this Valve and others of the same group, a large West Coast gas company standardized on Nordstrom Valves for its gas distribution system. Others followed suit, and the valve pictured above became the forerunner of several hundred thousand Nordstrom Valves now in service on artificial and natural gas lines. We know that at least 99% of all Nordstrom Valves that were ever installed on gas are still in service and will remain in use indefinitely, and that even the oldest of these are as efficient today as they were in 1920.

We do not claim that *every* Nordstrom Valve will give 15, 10 or even 5 years of service. But we can confidently assert that every Nordstrom will serve *longer* than any other type of valve—and particularly in severe instances where corrosion and erosion factors are present and where difficult conditions of temperature and pressure are predominant.



NORDSTROM *Lubricated* PLUG VALVES

Merco Nordstrom Valve Company

A Subsidiary of

Pittsburgh Equitable Meter Co.

Main Office: Pittsburgh, Penna. *Branch Offices:* New York City, Philadelphia, Columbia, Memphis, Chicago, Kansas City, Tulsa, Houston, Los Angeles, Oakland.

HOW MANY TOOLS DOES IT TAKE TO MAKE A JOINT ?

JUST 1

When You Use DRESSER Couplings

A DRESSER RATCHET WRENCH is simple, easy and speedy to operate. No other tool is needed to pull up the bolts on a Dresser Coupling. This one tool completely eliminates the need for noisy, expensive, complicated jointing equipment that involves heat or power.

With Dresser Ratchet Wrenches and Dresser Couplings, unskilled labor can make permanently, *absolutely* tight joints in minimum time. Manual operation of a Dresser Wrench requires very little effort and is exceptionally fast. The resulting tightness of the joints never fails to impress the engineer who has experienced difficulties with other types of construction.

S. R. DRESSER MANUFACTURING CO.
Bradford, Pa.

In Canada: Dresser Mfg. Company, Limited, 32 Front St., W., Toronto, Ontario

Dresser Products: STEEL COUPLINGS • CAST COUPLINGS • STEEL SLEEVES BELL JOINT CLAMPS • COLLAR LEAK CLAMPS • POROUS WELD CLAMPS • SPLIT REPAIR SLEEVES • EXPANSION JOINTS • REDUCING COUPLINGS • INSULATING COUPLINGS • RATCHET WRENCHES • *and many other modern accessories for pipe.*

June, 1935. Volume XI, Number 6. Western Gas is published monthly by Western Business Papers, Inc., at 810 South Spring Street, Los Angeles, California. Subscription price (in advance), 25 cents the copy; $2.00 per year; 2 years,, $3.00; $3.00 per year foreign. Entered as second cla s matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.

ADVERTISERS' INDEX

The American Brass Company	33
American Cast Iron Pipe Co.	51
American Gas Products Corporation	—
American Meter Company	8
American Stove Co.	—
Barber Gas Burner Co.	49
The Barrett Company	7
H. R. Basford Company	52
The Bristol Company	53
The Cast Iron Pipe Research Assn.	3
The Chaplin-Fulton Mfg. Company	56
The Cooper-Bessemer Corporation	4
Daniel Orifice Fitting Co.	40
Dearborn Chemical Company	54
Denver Fire Clay Co.	50
Detroit-Michigan Stove Company	31
S. R. Dresser Mfg. Company	1
Electrogas Furnace & Mfg. Co.	46
Electrolux Refrigerator Sales, Inc.	27
Ensign Carburetor Co.	47
Fluor Corporation, Ltd.	5
Fraser Furnace Company	52
General Ceramics Company	48
James Graham Manufacturing Co.	55
Handbook Butane-Propane Gases, 2nd Edition	34
Johns-Manville	—
Johnson Gas Appliance Co.	51
Jones & Laughlin Steel Corp'n.	—
Kerotest Mfg. Co.	36
The Linde Air Products Co.	—
Merco Nordstrom Valve Co.	2nd Cover
Minneapolis-Honeywell Regulator Co.	50
Mueller Co.	3rd Cover
L. J. Mueller Furnace Co.	30
National Tube Company	29
Natural Gas Equipment Inc.	47
Oxweld Acetylene Co.	—
Pacific Coast Gas Association	42
Pacific Gas and Electric Company	45
Pacific Gas Radiator Co.	54
Payne Furnace & Supply Co.	48
Peerless Manufacturing Corp.	51
Pittsburgh Equitable Meter Co.	2nd Cover
Pressed Steel Tank Company	37
The Prest-O-Lite Co., Inc.	—
Reliance Regulator Corp.	37
Republic Steel Corporation	Back Cover
Reynolds Gas Regulator Co.	Front Cover
Robertshaw Thermostat Co.	44
Geo. D. Roper Corp.	—
Safety Gas Main Stopper Co.	50
M. B. Skinner Co.	6
Spencer Thermostat Co.	40
The Sprague Meter Company	49
Surface Combustion Corp.	—
The Texacone Co.	46
Union Carbide & Carbon Co.	—
Union Carbide Sales Co.	—
United States Pipe and Foundry Co.	44
Utility Development Co.	40
Ward Heater Co.	46
Webster Engineering Co.	25
Welsbach Company	52
John Zink Burners	53

WESTERN GAS

"Reg. U. S. Pat. Off."

Publication Office: 810 South Spring Street, Los Angeles, Calif.
District Offices: 1064 Peoples Gas Building, Chicago; 447 Sutter Street, San Francisco

MEMBER PERIODICAL PUBLISHERS INSTITUTE — NRA CODE GRAPHIC ARTS INDUSTRY — MEMBER AUDIT BUREAU OF CIRCULATIONS

Contents for June, 1935

Review of the Month 9

New Scope for Appliance Loans . . . *By James R. Ferguson* 10

Engineering Data for Rate Case Valuation 11
By P. McDonald Biddison

Improvements in Compressor Station Technique 12
By B. L. Rogers

The Washington Plan . . . . . *By Walter M. Russell* 14

A Gas Man Talks with Plumbers . . . About Cooperation . . . 15

ABSTRACTS BY THE STAFF 16

Air Conditioning Load Potentialities 16

Natural Gas to Carburet Blue Water Gas 17

Cooperative Scheme for Leakage Survey 18

Increasing Plant Capacity for Peaks 19

United's "Handy Hot" Water Heater Campaign 20

Memphis Natural Gas Convention in Review 21
By George H. Finley

BUTANE-PROPANE NEWS 35

Best Gain Since 1931 Seen in 1934 Statistics 35

MEASUREMENT AND CONTROL 39

Factors and Trends in Meter Maintenance 39
By R. W. McClenahan

WITH THE ASSOCIATIONS 43

WESTERN GAS is published by Western Business Papers, Inc., 810 South Spring Street, Los Angeles, Calif.

Copyright, 1935, by Western Business Papers, Inc.

JAY JENKINS, Publisher GEORGE H. FINLEY, Editor CRAIG ESPY, Mid-Western Manager
W. G. RUSSELL, Field Representative

OFFICIAL PUBLICATION, Pacific Coast Gas Association; Southern California Meter Association

"LONG LIFE PIPE"

with gas-tight mechanical joints

Mechanical joints made by C. I. P. R. A. members are *bottle-tight* as demonstrated by rigid tests conducted by the laboratory of the American Gas Association. Cast iron pipe is unequalled for *long life* as attested by records showing that 29 of America's large cities are still served by some or all of their original cast iron gas mains laid from 44 to 101 years ago. Cast iron pipe and mechanical joints are an ideal combination for distribution mains.

The Cast Iron Pipe Research Ass'n, Thos. F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago, Ill.

CAST IRON PIPE

METHODS OF EVALUATING BIDS NOW IN USE BY ENGINEERS RATE THE USEFUL LIFE OF CAST IRON PIPE AT 100 YEARS

ANNOUNCING the NEW TYPE 12

THE new Type-12 is the result of three years of effort to produce an outstanding gas injection, two-cycle compressor unit.

It has greater accessibility than any previous two-cycle engine. All bearings — crank pin, crosshead, and mains — on a twin engine can be adjusted in less than 30 minutes.

It has greater overload capacity and better overall operating economy than any similar size compressor unit previously offered by anyone.

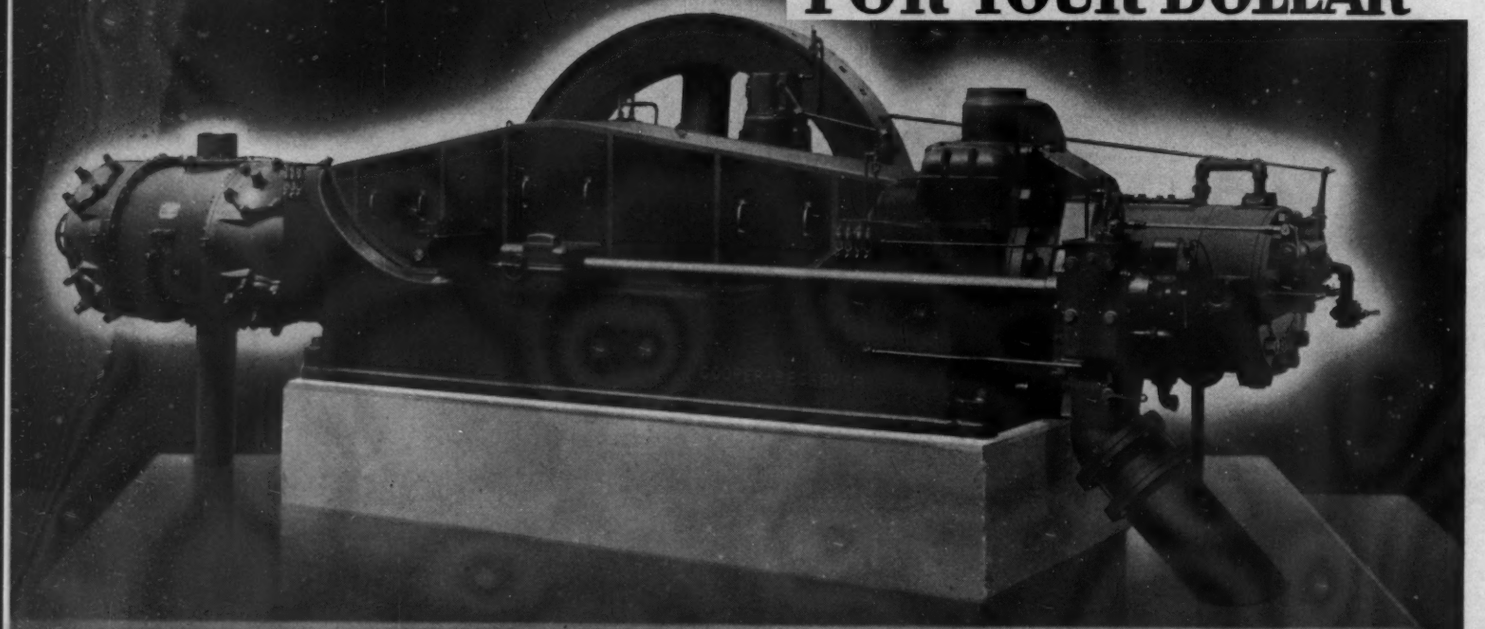
The new duplex scavenging air valve principle gives more uniform operation. Ask a Cooper-Bessemer representative to explain this new development to you.

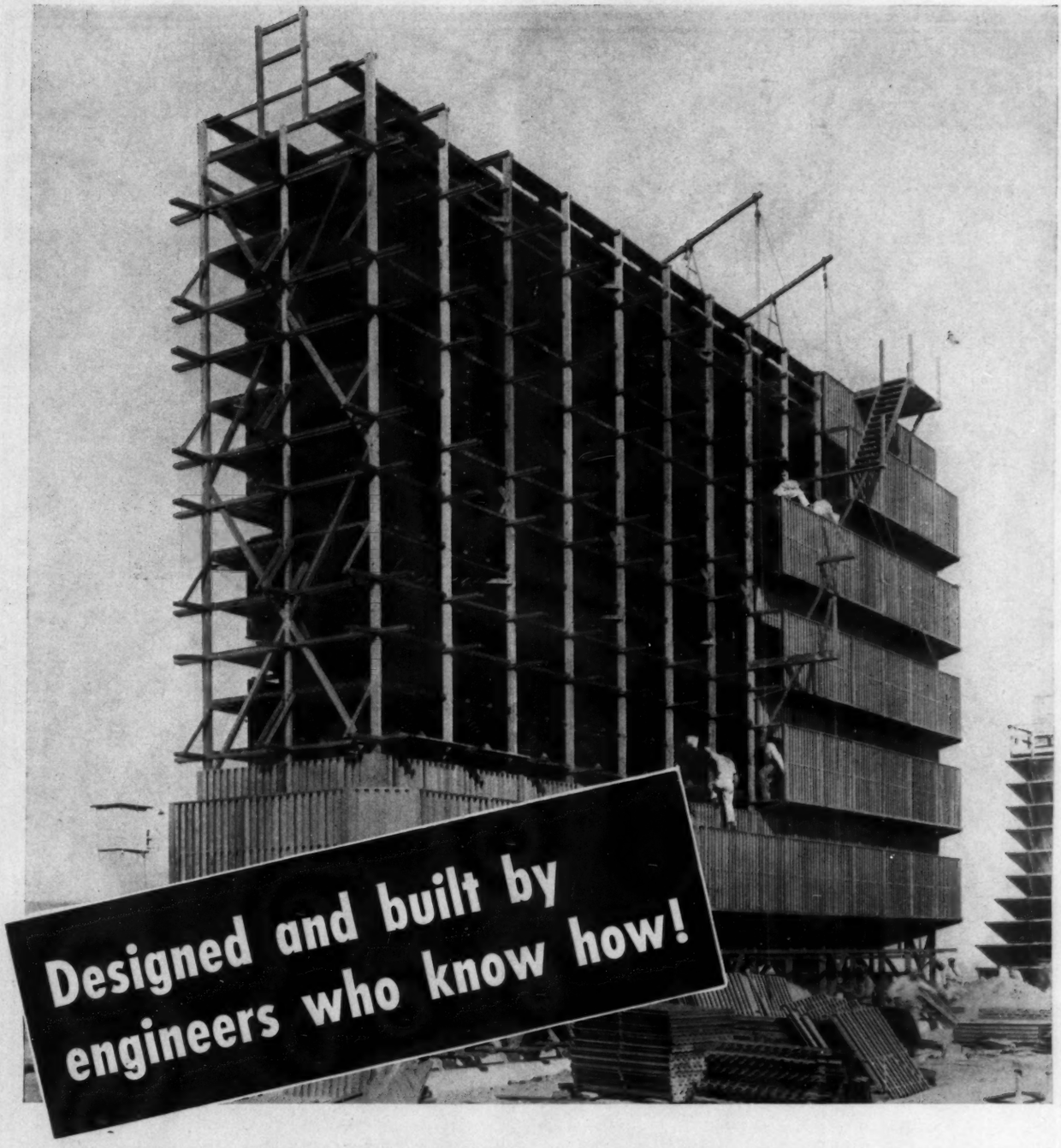
THE COOPER-BESSEMER CORPORATION

Mt. Vernon, Ohio — PLANTS — Grove City, Pennsylvania

25 West 43rd St., New York City
Mills Bldg., Washington, D. C.
640 E. 61st St., Los Angeles, Cal.
201 E. First St., Tulsa, Okla.
225 Crockett St., Shreveport, La.
Magnolia Bldg., Dallas, Texas
Esperson Bldg., Houston, Texas

MORE CAPACITY FOR YOUR DOLLAR





A specific development of Fluor's complete engineering and construction service has been the contribution of the Aerator Type Cooling Tower.

Three outstanding improvements have been achieved by Flour engineers in this unique design and construction. Most important of these is the complete elimination of wind-blown spray with its resulting water loss and the corrosive effect on nearby equipment. Second, is the assurance of equal cooling performance and direct savings in water costs, for the new Fluor Cooling Tower saves an average of from one to two percent of the water circulated in makeup requirements; and last, no additional ground space is required by this new type tower than by old style louvre type towers.

For 44 years the Fluor Corp. have specialized in wood frame construction. Structurally, Fluor Cooling Towers are sturdy. Their strength and durability defy the severest weather conditions and assure long life with less maintenance.

Fluor Aerators may be easily and economically applied to existing towers of the louvre type, with assurance of obtaining equal cooling performance, elimination of wind-blown spray and the resulting saving in water loss.

This organization's engineering and construction service covers all construction problems of the oil and gas industries.

Your request for bulletins will be given prompt attention.

Chicago, Ill.
McCormick Bldg.

Houston, Texas
1406 Esperson Bldg.

Alton, Ill.
2343 State St.

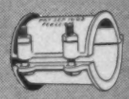
FLUOR CORPORATION
•LTD•
909 East 59th Street ● LOS ANGELES, CALIF

BE SURE WITH FLUOR

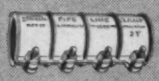
Tulsa, Okla.
Phil Tower Bldg.

New York, N. Y.
2020 W. 42nd St.

SKINNER

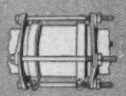


EMERGENCY PIPE CLAMP

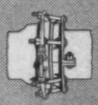


PIPE LINE CLAMP

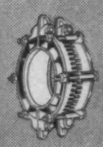
PIPE JOINT CLAMP



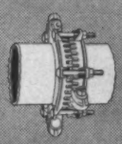
COLLAR LEAK CLAMP



BELL JOINT CLAMP



SPLIT COUPLING CLAMP

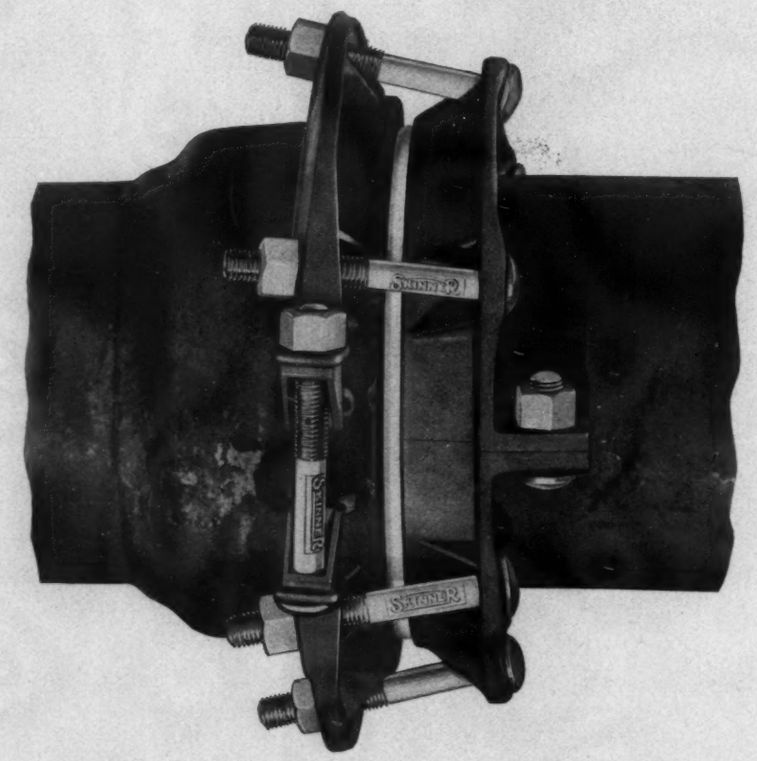


HIGH PRESSURE WELD CLAMP

SERVICE SADDLE

PRESSED STEEL ECONOMY CLAMP

A CLAMP FOR EVERY LEAK



A SEALED GASKET IS A PERMANENT GASKET!

● ONLY THE SKINNER BELL JOINT CLAMP gives you a soft rubber gasket completely sealed . . . (1) at the bell face by a Monel Metal band, (2) at the pipe by a hard vulcanized tip acting as a plug . . . *sealed* from air, *sealed* from water, *sealed* from the soil, *sealed* under pressure so that the gasket does not ooze out under vibration or line distortion.

Thus the Skinner Bell Joint Clamp is an absolutely permanent repair. Its complete self-adjustability, for variation in pipe diameters, cuts down the number of clamps you have to carry in your store room. Its speedy one-man application cuts job costs . . . Its permanence is long range economy . . . *Write for prices.*

Have You Catalog No. 35?

M. B. SKINNER COMPANY

Manufacturers and Engineers • Est. 1898

SOUTH BEND • • INDIANA

Barrett

PIPE LINE ENAMELS

Reproduction of the micrograph above shows the interlocking of the flakes of the internal reinforcement used by Barrett. By laminating with the waterproofing agent they give Barrett Pipe Line Enamels unusual toughness and resistance to soil stresses.

For pipe of large diameter, The Barrett Company will furnish equipment required to revolve pipe and spread enamel.

Effective . . . along any right of way

Barrett Pipe Line Enamels are the result of 81 years' experience in waterproofing all types of underground and underwater structures. They are a combination of specially refined coal-tar pitch and a unique, non-porous, dielectric flake-type filler. Under the severe conditions along the right of way Barrett Pipe Line Enamels, when properly applied, offer effective protection against soil acids or stray electrical currents. Barrett engineers will gladly assist you in working out the right coating and the right method to assure maximum protection at lowest cost per year of service.

THE BARRETT COMPANY, 40 RECTOR STREET, NEW YORK, N.Y.

FROM THE SMALLEST PILOT TO MAXIMUM CAPACITY.

It is the acid test for internal leakages . . . and the reason for the one piece body design of IRONCASE METERS. Body, table, partition, outlet channel and diaphragm channels are cast as one unit.

Machined joints are abolished . . . also the use of gaskets between table, channels and partitions. Thus internal leakages are overcome by eliminating the cause.

Catalog EG-40 describes the many advanced engineering features of IRONCASE METERS for low and high pressures. We shall be glad to mail you a copy.

AMERICAN METER COMPANY
INCORPORATED
Measurement and control of Gas, Oil, Steam, Air and Liquids
ESTABLISHED 1836
METRIC METAL WORKS *ERIE, PENNSYLVANIA*
Albany Baltimore Birmingham Boston Chicago Denver Erie Kansas City
Los Angeles Philadelphia Pittsburgh New York San Francisco
WESTCOTT & GREIS, INC., Dallas, Tulsa
CANADIAN METER CO. LTD., Hamilton, Ontario

AMERICAN METER CO

132

June, 1935

WESTERN GAS

"Reg.U. S. Pat. Off."

Vol. XI, No. 6

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

NRA Requiem

COLLAPSE of the NRA house of cards, with the Supreme Court's 9 to 0 decision, on the whole brought a breath of relief from business and industry. To the utilities it offers hope of a constitutional bulwark against other New Deal measures such as the Wheeler-Rayburn bill. Meanwhile the industry's manufacturers may be expected to do their utmost to preserve good elements of their own NRA code, in some form which can be administered under their own control.

Most elements, judging from early reactions, are content that the ruined Government structure should rest in peace—though that is probably too much to hope for. After feeling the pulse of press comments on the decision, the U. S. News in its June 3 issue states that 81 per cent of the nation's editors applaud the ruling as marking the end of undesirable conditions, while the other 19 per cent credit the NRA with beneficial results but do not question the need for restoring the constitutional division of duties between executive and legislative branches of government.

The utilities have never operated under NRA codes; approval of the codes formulated to govern them under the NRA has been persistently delayed by the administration, which can be understood since the Wheeler-Rayburn Bill's introduction. There were other plans in the making for control of the utilities.

Social ends sought by NRA should be given their due, though the procedure chosen to achieve them was faulty. Elimination of child labor and sweat shop conditions, adoption of subsistence wage minimums, work-sharing through shorter hours, and elimination of unfair trade practices are universally desired by responsible employers in every line. It is to be hoped that agreements within industry—free from the fettering hand of government—will be reached to hold the ground won by NRA in these directions. Some of these ends can be obtained through specific legislation.

Labor standards maintained both by utilities and the responsible manufacturers serving the utilities were on the whole well above national averages before NRA was thought of. No let-down of these standards is to be looked for.

Of the fair trade practices angle it may be said that the gas appliance industry had its chislers, as did all industry, before NRA. It had them during the experiment, too, and it always will have them. Ethics cannot be legislated, and every industry may expect to carry along what has aptly been called its "lunatic fringe" made up of those who will undercut prices and quality.

A national meeting of gas industry manufacturers has been called for June 11, and a meeting of the Code Authority for June 19, to see what it is desirable and possible to salvage from NRA. Certainly the maintenance of minimum wages and hours, and the exchange of reliable price information, are desirable. If association ties among the manufacturers may be strengthened to that end, much benefit will result.

There is much speculation on what effect the NRA decision will have on pending legislation, including that affecting utility holding companies and that defining T. V. A. powers. Some hold that interstate commerce interpretations contained in the NRA opinion would rule out the proposed holding company legislation since holding companies are incorporated in individual states and their interstate transmission functions are performed by separate operating companies.

Of closely related interest to utilities is the bill now resting in the Military Affairs Committee of the House, to clarify powers of T.V.A. If the pendulum swings in the right direction the T.V.A. experiment in national power production and sale may receive a decided check. Institution of a cost accounting system established by the Federal Power Commission, placing of construction expenditures under control of the Comptroller-General, banning sale of power below cost of production, prohibiting purchase of private electrical systems, and definitely restricting T.V.A. authority to the Tennessee River—these are some of the possibilities for amendment to the present T.V.A. act.

NEXT MONTH WITH "WESTERN GAS"

How to Engineer Domestic Appliance Installations

A series of articles on this important phase of appliance utilization—beginning in July.

Dealer Program

How an Oklahoma company gets sales results in the face of a state law prohibiting utility merchandising.

Water Heater Servicing

Outline of a job training course in how to best service modern gas water heating equipment.

Group Sales

Effective organization of non-sales employees in a large utility for assistance in load promotion.

New Scope for Appliance Loans

P. G. AND E. PLAN FINANCES $35 MINIMUM PURCHASES

By JAMES R. FERGUSON

AN important precedent in long-term appliance financing under the F.H.A. Better Housing Program has been set in the territory of the Pacific Gas and Electric Co. with the application, as of May 1, 1935, of the "F.H.A. Finance Plan for Users of P. G. and E. Service by Arrangement with American Trust Co." The outstanding feature of the plan is that financing has been extended to a $35 minimum, whereas financing under the F.H.A. has heretofore been limited to minimums of $200. Thus, long-term financing will now be possible for a greatly increased range of gas and electric appliances.

As by far the greater proportion of appliance sales in this territory is handled through dealers, it is expected that the dealers will realize the greatest benefit from the finance plan. All sales will be financed through offices of the American Trust Co., the dealers receiving immediate cash payment and thus being relieved of carrying credit which, in many cases, might otherwise be prohibitive.

Although the plan was worked out, in the first instance, with the American Trust Co., it will very likely be extended to other branch and local banks as it proceeds to function. Simplified directions for its application have been printed by the Pacific Gas and Electric Co. for distribution by the banks and dealers.

An outline of the plan is as follows:

I. Purpose:

Recognizing the opportunities for the sale and installation of gas and electric consuming appliances and the financing of these sales through the Modernization Credit Plan, provided for in Title I of the "National Housing Act," this plan has been devised to facilitate the making of these loans in a quick and simple manner. This plan is made possible through close cooperation with the American Trust Co. and its branch banks located in the various cities throughout Northern California.

Through this arrangement, customers of the P. G. and E. are able to buy gas and electric appliances and pay for them on the most liberal terms and at the lowest interest carrying charge ever offered.

II. Qualifications for Loans:

A. Credit under this plan is based primarily on character and earning power. There are two major requirements in making a loan:

(1) The person making the loan must be the owner of the property in fee; life tenants; persons holding an equity under mortgage, deed of trust or contract; persons holding a leasehold under a renewable lease for 99 years or more; or persons holding a leasehold which has more than 50 years to run.

(2) Persons making these notes must have an annual income at least five times as great as the amount of annual payments on the note.

B. This plan applies specifically to appliances and other equipment eligible for F.H.A. financing and which are served by the Pacific Gas and Electric Co. Gas appliances must be connected permanently by means of gas piping. The gas appliances which are eligible for financing under this plan, including their installation, are as follows:

Gas ranges.
Gas furnaces, controls and installation.
Gas boilers, both high and low pressure.
Steam heating systems.
Gas circulating heaters.
Gas water heaters.
Floor furnaces.
Wall type heaters.
Radiant heaters.
Industrial unit heaters.
Gas steam radiators.
Gas refrigerators.

C. Any person, firm or corporation regularly engaged in selling appliances which are eligible for financing under this plan, and who is accepted by the American Trust Co., may participate in the provisions of said plan.

III. Territory Covered:

This plan applies to the entire territory served by Pacific Gas and Electric Co.

IV. Duration:

This plan will remain in effect for the remainder of the calendar year 1935 and such time thereafter as may be authorized.

V. Terms:

The amount financed for the improvement of any one piece of property under this plan is limited to $35 minimum and $2,000 maximum, including sales tax. Where the cash balance is $2,000 or less, but the terms balance is over $2,000, one conditional sale contract and two Federal Housing notes shall be written in as nearly equal amounts as possible. The minimum monthly payment shall not be less than $3 per month. The number of monthly payments shall in no case be less than 12, nor more than 36.

Notes must be payable in equal monthly installments except the final installment which may be slightly less. However, if the income of the maker is received in the form of proceeds from the sale of agricultural crops or live stock, notes may be made payable in installments corresponding to income dates shown on the property owner's credit statement. No other deferred dating for payment is permitted under this plan.

VI. Interest Carrying Charge:

The interest carrying charge which shall be used in connection with this plan is set up in the chart entitled, "F.H.A. Gross Charge Table." If the purchaser desires to pay the contract up in full prior to expiration date, a rebate will be made at the rate of 5 per cent simple interest on the prepaid installments.

A procedure is set up for handling loans in communities where the American Trust Co. maintains branches, and also where it has no branches, details of the plan differing somewhat for the two conditions.

The Pacific Gas and Electric Co. has made this plan for appliance financing an integral part of its comprehensive Sales-Service-Survey for 1935.

ENGINEERING DATA FOR RATE CASE VALUATION

By P. McDONALD BIDDISON Consulting Engineer Dallas, Texas

THE requirements for valuation of natural gas properties arise occasionally out of requirements for tax renditions, more frequently out of sales or consolidations of properties, but most frequently out of retail rate investigations. The essential data and the course of procedure are the same for all purposes. The purpose of this article is to point out some of the engineering data that may advantageously be kept or accumulated as an operating routine in anticipation of a rate case, the need for which may quickly arise from the present agitation over utility rates.

The first step for a valuation is the procurement of a reliable inventory. Most operating heads think they currently have a good inventory of property. Usually, however, when the need for one arises it is found that for the practical purposes of establishing values they have little if any use. The delay in procuring an inventory is often costly. Maps do not constitute an inventory and it is seldom that plant and investment ledgers, construction ledgers and other records are kept in enough detail that either quantities of materials. location of property, or description of items may be used. All three are necessary to the inventory. For the purposes of valuation the records are usually particularly lacking in description of items. For such a purpose it is necessary, on most items, that the description be fully as complete as the specifications on a purchase order. Consider the items of pipe. Do your records disclose size, weight, joint length, class of material, finish on ends, type of weld, data on protective coating, class (plain end, screwed), method of laying (welded, coupled, screwed), and are your records up to date as to alterations in quantities or descriptions brought about during operations since completion of original construction and all these correlated to specific locations? Will your records disclose whether a valve has screwed ends, flanged ends, outside screw and yoke or non-rising stem, iron, steel, semi-steel, brass or bronzed body, wedge type, double disc gate, globe or angle type, the materials of discs and seats, its working or test pressure or manufacturer's list number? On structures the description or available drawings, to be of use in valuation, must be in sufficient detail that a contractor bidding on its construction could take off a complete bill of material and make a bid on its construction.

P. M. Biddison

If an inventory, of recent date and with proper description of items, be available at the beginning of a valuation of property price inquiries may be immediately sent out, based upon the quantities of the various items in the system, and the time required for the entire job usually cut in half for price books may then be compiled while final inventory sheets and unit cost data are being prepared. A price book annually revised for such an inventory will usually be found justified.

Form of Cost Analysis

Cost analysis of construction on the plant being evaluated is the best possible basis for establishing the unit costs of installation for a valuation. To be of value at a period so remote that wage scales have fluctuated in the interim such analysis must be on the basis of performance in man hours instead of in dollars and the labor hours must be so classified that prevailing rates may be applied to each class of labor. The labor hours must be further classified as to subdivisions of the construction operations as between hauling, ditching, welding, laying, painting, back-filling, etc., and related to suitable units of each subdivision, such as cubic yards of excavation or fill, tons of hauling, joints of each size welded, etc., if they are to be safely and rationally applied to a piece of construction not identical with the one on which the performance was incurred. It is desirable to have information as to time lost in moving crews, idle time paid for on account of weather or any other hazards, to establish a ratio between hours paid for and hours of actually productive employment since instantaneous time studies reflect no cost for lost time. To meet these requirements field cost accounting is necessary for it is seldom that an analysis of payrolls not made with such detail in view can be broken down for use in valuation. The charges for use of equipment on such construction require the same treatment as for labor. Of course valuations can be and are made without such data from the plants being evaluated, but data from the particular plant under consideration will tend to give effect to the peculiar local conditions as to soils, obstructions, general hazards and the characteristics of the labor supply available to the locality.

Usable data are ordinarily lacking, except on plants of recent construction, as to field supervision costs, stores expense, tool expense, and general overhead costs. For construction by operating organizations charges to investment for general overhead costs are often not made and because they have not been so made there has been a tendency among commissions to disallow them in the rate base in spite of the fact that they would of necessity be incurred in reproduction of the property and even though they were incurred in actual construction, though maybe in a lesser degree and their cost borne by operating charges, when built by an operating organization. If, as a matter of policy an organization would prefer to absorb such costs into operating charges and take the risk of losing them upon a revaluation of plant, well and good. Otherwise charges should be made and an analysis that will be explainable in court should be available for them.

Excellent and usable data on field supervision costs, stores expense and tool expense may be had from the construction work usually done from time to time on a normally growing operating plant. If such costs be kept in detail in such classifications and analysed once a year by man hours, equipment hours and materials it will be ready when desired and will be the best possible evidence to substantiate the claims for such allowances upon a hearing.

The item of Preliminary and Organization Expense has been roughly

(Continued on Page 54)

Improvements in the Technique of

Compressor Station Operation

AS the progress of the automobile industry has exerted a great influence on the solution of problems of the designer and manufacturer of gas engines, so have those who have compressor station investment in their charge, taken various "leaves from the book" of that industry, and adapted them to the betterment of equipment of older design.

Noteworthy among the power plant problems to which the automotive industry's progress has forced attention and study, are those of valve and valve seat wear, valve cooling, cylinder and ring wear, bearing life and vibration, and the selection of lubricants.

Since the advent of the small single-acting, horizontal engine, with air-cooled, truncated piston, its accessibility has made intensive study of many of these problems general.

More suitable metals containing *nickel, chromium,* and *molybdenum,* which have appeared in valves and valve seats on more recent engines, demonstrating that circulating cooling water through the valve and stem is unnecessary, have brought greatly increased life to the valves and seats. This has caused these metals to be used on older engines, eliminating water circulation through valves, and bringing the same relief from frequent grinding and the same increase in valve life.

In some cases it has been found most satisfactory to "salt-cool" hollow valves, to avoid the necessity for circulating water through them. Cooling water circulation has been brought closer to the actual valve seat area and in some cases even circulated through *inserted valve seats,* improving their life. The jetting of water into the valve casing, causing turbulence in the part of the jacket nearest the valve seat, which many 1935 automobile engine models have pioneered, will be watched with a great deal of interest.

Main and Connecting Rod Bearings

The evolution of main and connecting rod bearings for gas engines has been as eventful of late years as has the improvement of automobile engines. Ever since the World War superior bearing metals have been available at a reasonable cost and the following general practices are among the noteworthy advances:

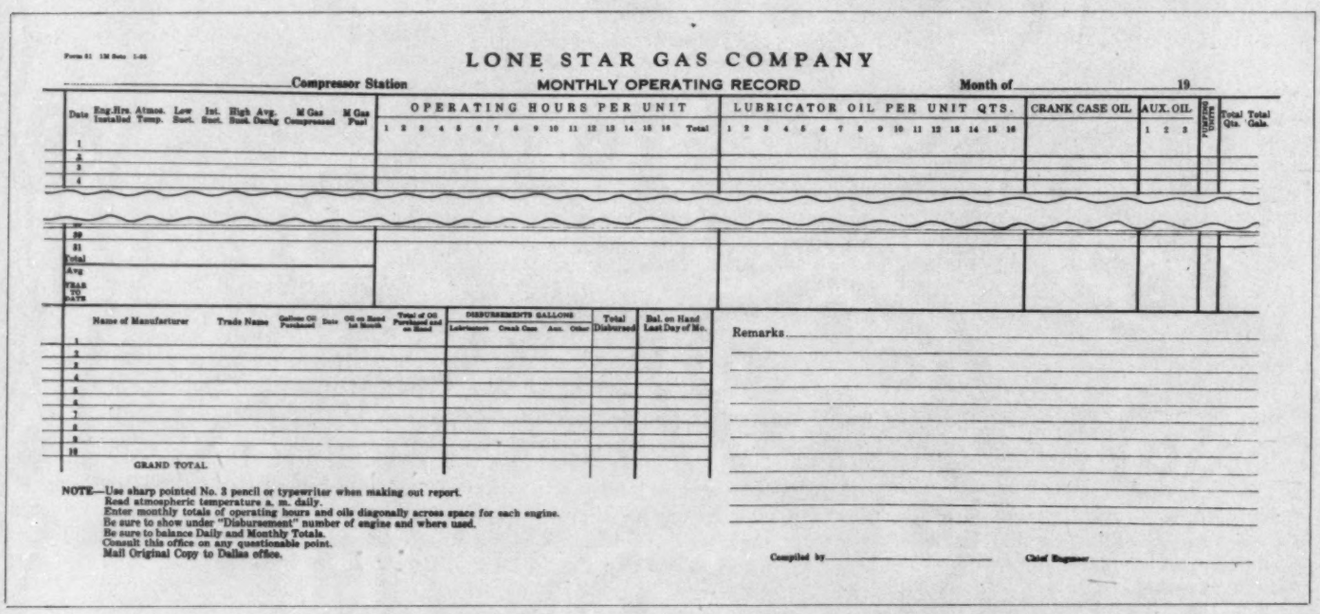
1. The practice of "tinning" the shells, to flux the bearing metal firmly to the shell.
2. The complete absence of oil grooves, except one narrow one in the "bottom shell" directly under the axis of the shaft and perpendicular to the rotation, to insure a complete oil film quickly.
3. Slightly chamfering each shell on the edge opposing the rotation to speed up the establishment of the oil film.
4. The realization that 95 per cent of all lost bearings were "hammered out" rather than burned out, has brought about the practice of adjusting them extremely close.

In this connection it has long been general practice to tighten all main bearings while the engine is running, pulling the wedge tight, using a short handled wrench, relying upon the sense of touch rather than brute strength, and never backing off on the wedge bolt.

Also to tighten connecting rod bearings, do so immediately after stopping the engine, while the "running heat" is still in bearings and pins, pulling them perfectly snug, without any "back off" on the wedge bolt.

Frequent inspections are made of the main bearing adjustment by applying a "dial tester" reading in thousandths of an inch, by means of a rod extending through the "inspection well" in the "top shell" to the top of the shaft. This indicates the vertical movement of the shaft and a tolerance of .044 inch is the maximum permitted.

Since inaugurating these practices many plants have gone for several years (1) without the loss of a bearing; (2) without the loss of a foundation bolt;



LONE STAR GAS COMPANY

Compressor Station MONTHLY OPERATING RECORD Month of 19

Date	Eng. Hrs. Installed	Atmos. Temp.	Low Suct.	Int. Suct.	High Suct.	Avg. Suct. Gauge	M Gas Compressed	M Gas Fuel	OPERATING HOURS PER UNIT 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Total	LUBRICATOR OIL PER UNIT QTS. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	CRANK CASE OIL	AUX. OIL 1 2 3	PURIFIER OIL	Total Qts.	Total Gals.
1															
2															
3															
4															
30															
31															
Total															
Avg															
YEAR TO DATE															

	Name of Manufacturer	Trade Name	Gallons Oil Purchased	Date	Oil on Hand 1st Month	Total of Oil Purchased and on Hand	DISBURSEMENTS GALLONS Lubricators	Crank Case	Aux.	Other	Total Disbursed	Bal. on Hand Last Day of Mo.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
	GRAND TOTAL											

Remarks

NOTE—Use sharp pointed No. 3 pencil or typewriter when making out report.
Read atmospheric temperature a. m. daily.
Enter monthly totals of operating hours and oils diagonally across space for each engine.
Be sure to show under "Disbursement" number of engine and where used.
Be sure to balance Daily and Monthly Totals.
Consult this office on any questionable point.
Mail Original Copy to Dallas office.

Compiled by Chief Engineer

By B. L. ROGERS

Superintendent Compressor Stations
Lone Star Gas Company
Dallas, Texas*

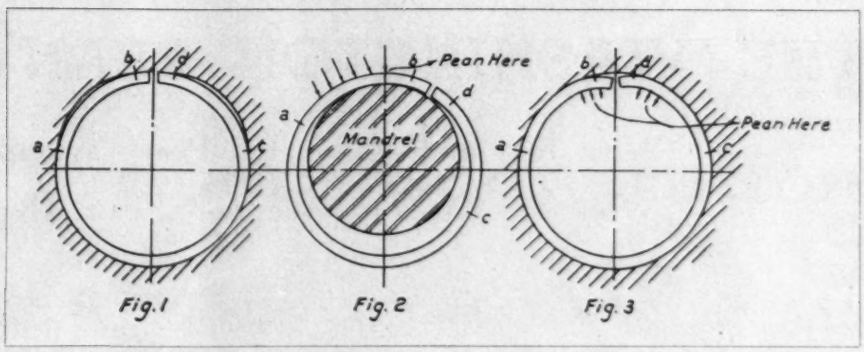
(3) without the necessity to regrout an engine; (4) without a noticeable longitudinal vibration of foundation blocks.

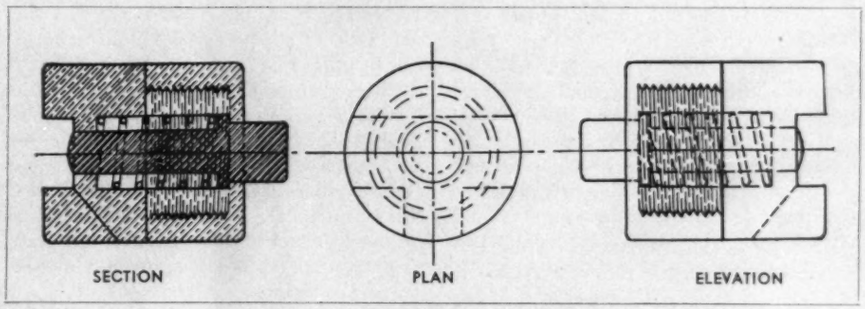
Importance of Ring Fit Realized

Various ingenious and practical methods of building "tension" into piston rings have been developed. (1) But how often is a new bore of precisely the diameter for which the ring was made? In many makes of large engines a wide tolerance is found, and no two sets of rings will fit the respective bores exactly alike. (2) Also stock rings do not often closely fit the cylinder, which we find to be of a slightly different diameter than we anticipated, when ordering rings. (3) Again when a cylinder which is to be fitted with new rings is taken down, the horizontal and vertical micrometer measurements are rarely found to be exactly alike.

Peaning Rings

A simple means has been found of remedying this difficulty and assuring a perfect fit within .002 inch at all points on the ring circumference, regardless of whether a bore is round or slightly elliptical. This simple means consists of peaning the ring lightly but firmly with a small, soft brass, ball pean hammer, or by means of a "peaning tool." Method and one type of "peaning tool" are illustrated in simple sketches.





Peaning Tool.

Assume that snap ring in Fig. 1 is placed in bore, the gap in ring being in the position in which it will be when piston is in place. And the portions A-B and C-D of the ring do not touch the bore, by .010-inch to .015-inch at a point mid-way between A and B and mid-way between C and D.

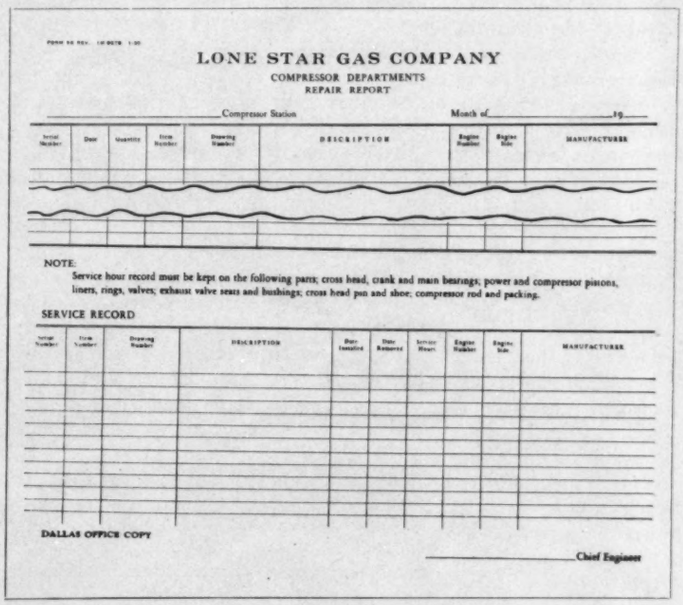
Locate "A" on the ring as the first point at which the ring leaves the bore by .002 inch and mark point on ring with chalk. Also locate "B" on the ring as the last point to which a .002 inch feeler will swing between ring and the bore and mark with chalk. Locate points C and D in the same way and mark with chalk.

Then using for a mandrel any machined surface, which has a diameter reasonably close to the inside diameter of the ring, place the ring over this mandrel and locating the approximate mid-point between A and B on the ring, and marking with chalk, hold the ring squarely on the mandrel and pean lightly but firmly, with either a light weight, soft brass, ball pean hammer or a peaning tool, for a distance usually about one-half the distance toward "A" from the mid-point and toward "B" from the mid-point. Turn the ring slightly on the mandrel so that the blow will strike directly in line with the common vertical centerline of the mandrel and the ring and lighten the blows slightly as the point struck approaches "A" and "B" respectively. The number and weight of the blows necessary can quickly be determined, but at first ring will have to be tried in the bore repeatedly to note progress. Most operators quickly become expert if careful at first.

Fig. 3 shows same ring in the bore after "A-B" and "C-D" have been peaned until all points between A and B and between C and D come within .002 inch of contact with the bore.

(Continued on Page 46)

* Presented before the Natural Gas Department, American Gas Association, Memphis, Tenn., May 6-9, 1935.



LONE STAR GAS COMPANY
COMPRESSOR DEPARTMENTS
REPAIR REPORT

Compressor Station _____ Month of _____ 19__

Serial Number	Date	Quantity	Item Number	Drawing Number	DESCRIPTION	Engine Number	Engine Side	MANUFACTURER

NOTE:
Service hour record must be kept on the following parts; cross head, crank and main bearings; power and compressor pistons, liners, rings, valves; exhaust valve seats and bushings; cross head pin and shoe; compressor rod and packing.

SERVICE RECORD

Serial Number	Item Number	Drawing Number	DESCRIPTION	Date Installed	Date Removed	Service Hours	Engine Number	Engine Side	MANUFACTURER

DALLAS OFFICE COPY

_____ Chief Engineer

On this and the opposite page are shown two forms for recording information on compressor station operation, in use by Lone Star Gas Co. Plant chief engineers enter these forms daily and forward them monthly to the general office.

THE WASHINGTON PLAN

What Is This "Washington Plan" System of Rate-Making? Will It Work for Gas Properties? — Read These Questions and Answers.

By WALTER M. RUSSELL, Washington, D. C.

IN THE present controversy over electric rates in New York City the Chairman of the New York Consolidated Gas Co. has suggested that the "Washington Plan" might serve as the basis of an agreement. It is possible that many people connected with the gas industry are unfamiliar with this system of rate-making. The following series of questions and answers attempts to set forth briefly, the method of application and the advantages of the plan.

Is the plan a proposal of the Administration, the N.R.A., etc.?

None of the alphabetical organizations has had anything to do with it. The plan has been in successful operation since 1924, applied to the rates and earnings of the Potomac Electric Power Co., serving Washington, D. C.

Can it be applied equally well to gas and electric rates?

Yes, it can be applied to the sale of any regulated public service, gas, telephone, power, water, or transportation.

Does it require a complete revision of the rate structure?

No, any rate structure or schedule can be used under the plan, but it offers a most desirable annual opportunity for rate revision, favorable to the promotion of new business.

What are the essential elements of the plan?

To operate under this plan it is necessary for a valuation to be agreed upon between the utility and the controlling body. A standard or minimum rate of return must be determined and agreed upon, as for example, 6, 7, or 8 per cent. Starting with the initial valuation which is as of January 1 of the year in which the plan first functions, the "weighted rate base" for each year must be found. At the end of the first year, the cash, materials and supplies are deducted from the valuation at the beginning of the year. Then the net additions and betterments to property, the cash, materials and supplies at the end of the year are added. This gives the rate base at the end of the year, which must now be weighted by rather complicated calculations which in effect give the average rate base for the entire 12-month period.

On this weighted rate base the percentage return is calculated. The same procedure is followed in subsequent years. At the end of each year the net earnings after depreciation and taxes but before interest and dividends are determined. From this sum is deducted the amount of money equivalent to the standard return on the weighted rate base, leaving a balance or "excess."

A new rate for the coming year is now constructed, the application of which will result in a reduction to the consumers equal to a portion of the excess. In Washington the reduction must be 50 per cent of the excess earnings above 7 and under 8¼ per cent, then in addition 60 per cent of the excess earnings between 8¼ and 9 per cent, and 75 per cent of the excess above 9 per cent.

Is the rate base depreciated each year before calculating amount of money needed for standard rate of return?

It will be observed that this plan accepts a valuation as of some given date, which valuation is increased by the net additions and betterments each year, and that the rate of return is calculated on this *undepreciated* rate base. It must not be assumed, however, that the effect of depreciation on the property value and rate is neglected. It is taken care of by means of an interest on depreciation reserve accrual and calculation in the following manner. Retirement expense is credited to depreciation reserve each year. Interest at 4 per cent on the depreciation reserve is charged to gross income and credited to retirement expense, thus lessening the amount of retirement expense charged to operation and thus borne by the consumer.

It will be seen, therefore, that from the amount which the company has available for return, interest on funded debt, interest on depreciation reserve and dividends must be paid, so that in effect the 7 per cent return allowed the company is actually diminished by the amount of interest on the depreciation reserve. If, for example, the depreciation reserve is 17 per cent of the rate base and 4 per cent is charged this would be equivalent to the .7 per cent on the rate base or in other words the company has available for its purposes 7 per cent less .7 per cent or 6.3 per cent. This is the same thing as a rate base depreciated by about 10 per cent. Inasmuch as this 4 per cent interest accrues on the depreciation reserve every year and is compounded, it will be seen that the earnings on the original valuation and on the net additions are consistently less each year, as the depreciation reserve grows. Calculations have been made which show that the effect of this interest accrual is equivalent to a straight line depreciation of property at a rate of 2½ per cent. As the rate base includes land and buildings as well as overhead and underground equipment, the rate is reasonable.

What benefits do the consumers derive under this plan?

The public is assured, first, that there will be an automatic reduction in rates each year, without the necessity of a rate fight, if the utility has earned more than the standard percentage rate of return. Second, by reason of the progressive character of this plan a successful utility will be charging lower and lower rates with the result that there will be continuing and increasing pressure on the management to develop the highest possible efficiency in operation, to aggressively pursue new business, and to make no unwise and unprofitable investments.

What benefits will the utility derive?

Politics and politicians are removed from the field of agitation against rates. The expense of periodical investigations is avoided. If earnings exceed the base rate the company is afforded the annual opportunity of adjusting its rate schedule to increase its promotional features. This is particularly important in the gas industry where promotional rates have not as yet been widely adopted. Percentage rate cuts are avoided which is very important as a straight percentage rate cut affects all rates equally and may cause a considerable group of customers to be served at a loss.

Stockholders are not penalized by the efficient operation of their managements but in effect receive a bonus for good work, resulting in lower rates.

(Continued on Page 50)

A Gas Man Talks with Plumbers ... about Cooperation

NOTHING but good can come from plain speaking, where dealer cooperation is concerned. A strong expression of gas company viewpoint, made to a group of plumbers last month, is reviewed below. The fact that the speaker has done much to further dealer cooperation in his area adds force to his message.—EDITOR.

IN the practical matter of working out a program for gas company and dealer cooperation on appliance sales there are limits which must be observed by both parties. Most local situations perhaps will never reach 100 per cent perfection, but if both company and dealers keep an open-minded viewpoint and are willing to meet on middle ground when the inevitable misunderstandings arise, much may be done for the advantage of each. And the right atmosphere to work in, in this matter of developing a dealer cooperation program, seems to be that of cultivating a mutual respect for the other's limitations. That means a constant and frank exchange of views.

In each local situation the case calls for absolute understanding of what the gas company will do and is doing to aid in dealer sales; and, no less, of what the dealer must do to make himself eligible for that aid.

A fine example of a plain statement on dealer policies is that submitted to the State Association of Master Plumbers of California by F. M. Banks, vice-president in charge of sales for the Southern California Gas Co., at the group's 34th annual convention in session at Santa Monica, Calif., from May 20 to May 24.

Addressing the master plumber group on "Beneficial Results of Cooperation" Mr. Banks at the outset disclaimed any desire to preach; what he intended was a statement of facts on how far cooperation had progressed in his own territory.

He first reviewed the development of statewide cooperation with the California master plumbers, in the course of which standards of practice were settled upon, mutually satisfactory to companies and dealers, and two regional committees were set up in northern and southern parts of the state to handle problems which might arise in application of the cooperative program.

The platform adopted for company-dealer relationship called for some changes in gas company practice. These were made, in spite of many difficulties involved. Mr. Banks proceeded to give the facts on these changes. First there was the matter of utility sale of appliances to its employees. In some cases such sales had gone beyond the employee ranks, employees purchasing for their relatives and friends, and thus cutting into retail markets. This abuse has been eliminated and company practice standardized on selling to employees for their use only. Employee discounts are held to 20 per cent, except on certain promotional appliances.

Then there was the subject of salesman compensation. Competition of company salesmen on dealer sales was eliminated at one blow by giving equal commission credit to company salesmen, no matter whether their sales are consummated through company or through dealer. This radical change in former procedure was not instituted easily—but the companies went the limit in removing this source of contention.

Mr. Banks pointed out the obvious fact that these cooperative moves proceeded on the assumption that increased sales through dealers would justify them. There is no substitute for volume sales. Conditions of the day positively demand that gas companies get modern appliances out on their lines in greater number per customer than ever before, and this will be done—through cooperation with the dealer, preferably, if he measures up to the obligation created by such cooperative overtures as those mentioned in Mr. Banks' message. In many sections of the country mass selling of gas appliances is proceeding, in most cases with the dealer an integral part of the picture, but in some cases—where dealers are slow to see the possibilities in cooperation, the program goes on without them. Load must and will be built.

In their advertising, too, many gas companies have departed from former practice to the potential advantage of dealer outlets. Instead of the former direct sales copy on definite appliances they are now advertising chiefly the convenience of modern gas home services. This generalized type of copy is carried in the expectation that dealers will fill the gap and advertise their definite lines of appliances in greater degree than hitherto.

Gas refrigerator sales, Mr. Banks went on to say, have been passed through dealer channels in greater degree in California than in most sections of the country, the plumber being the most numerous among the dealers in this appliance. On one company's system 80 per cent of Electrolux sales are made by dealers. Yet there has been little appreciation manifest for the gas companies' passing this business along. In fact, some plumbers have been so narrow-gauge in their thinking as to demand that the companies limit dealer sales of gas refrigerators to plumbers—completely ignoring the load-building problem of the companies and the fact that other dealer outlets are entitled to consideration.

A side of the merchandising question not often brought before dealers was presented by Mr. Banks when he pointed out the advantages accruing to those gas companies which do the bulk of appliance business in their territory. Such companies have a merchandising margin to go on. They know that all contacts with customers are made in good faith. They know absolutely the quality of appliances going onto their lines. And they can use profitable, direct-sales advertising.

Many companies have conducted extensive surveys of their gas systems to uncover appliance prospects, and have passed the cream of these out to dealers. They have discontinued a good deal of servicing on water heaters, turning this business to plumbers or manufacturers. Little enough appreciation comes back to the gas companies for these cooperative tactics.

Financing of dealer sales was another matter on which Mr. Banks gave the gas company viewpoint. In southern California a particularly liberal plan is in effect, which was described in *Western Gas* for April. Dealers are relieved

(Continued on Page 23)

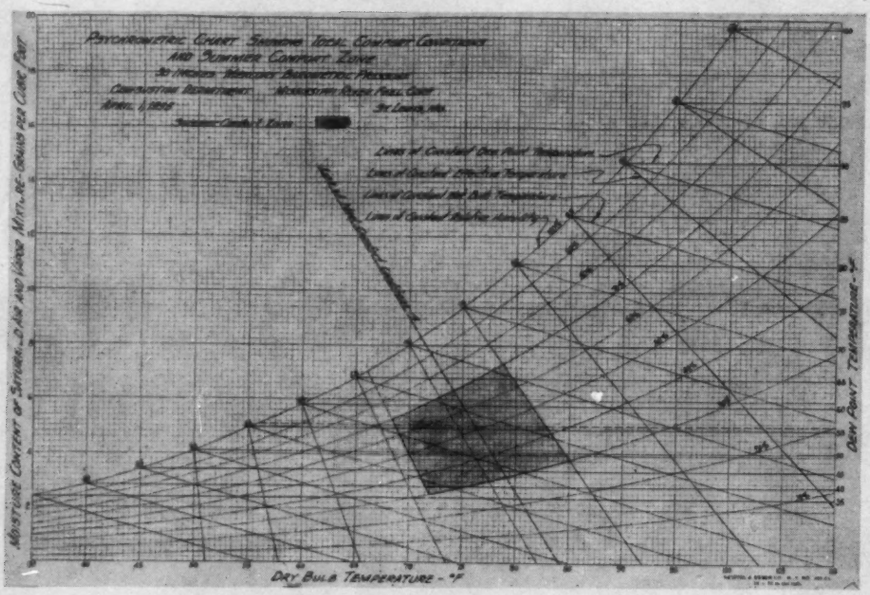


Fig. 1.

Air Conditioning Load Potentialities

● GEORGE M. PARKER, Mississippi River Fuel Corp., St. Louis, Mo.; addressing Natural Gas Department, American Gas Association, Memphis, Tenn., May 6-9, 1935.—(Abstract by WESTERN GAS).

IT is now realized that the science of air conditioning is really made up of three problems: (1) The removal of impurities and extraneous matter from the air to be conditioned; (2) The dehumidification of the air to be conditioned in order to maintain the proper relative humidity; (3) The cooling of the dehumidified and purified air when necessary.

George M. Parker

With the recognition of these facts, the problem is now being attacked in the proper way and air conditioning apparatus is being designed and built which will accomplish the desired results.

In air conditioning the home it seems probable that the air must be filtered through some sort of a dry filter or else too much moisture will be picked up and an excessive load placed upon the dehumidifying apparatus. However, there are on the market many kinds of satisfactory filters through which air can be forced with a minimum of friction and yet with the elimination of the major portion of the usual impurities and extraneous matter.

Dehumidification is the most important element in the proper conditioning of air. This can be done in several ways but it is now conceded that dehumidification by adsorption is the most practical method. To remove an appreciable amount of moisture by refrigeration the air to be treated must be cooled below a predetermined dew point. Where large volumes of air are concerned this is a costly and impractical procedure. There are a number of suitable adsorbents, the principle ones being activated alumina, silica gel, lithium chloride and calcium chloride.

Using these adsorbents, domestic dehumidification and conditioning units are being built on a production basis and offered to the public as a result of several years of research and practical experiment on the part of the gas industry.

In most instances the gas load available from an air conditioning plant will be that amount of heat input necessary for the periodic reactivating of the adsorption beds.

Of the various means of cooling available, circulating water is probably the most economical and practical at this time. From the standpoint of the gas company, however, it would be highly desirable to develop a gas-fired refrigerating unit or gas driven mechanical refrigerating machine of suitable capacity and efficiency to be applicable to home air conditioning since a very considerable additional summer gas load could be derived from this source.

A definite study has been made of the possibilities of the summer air conditioning load in St. Louis as related to the winter heating load when applied to a house of definite size and construction, to see what effect would be had on annual load factor and total annual sales. The psychrometric chart shown in Fig. 1 was developed to show "effective temperature" lines and summer comfort zone. Effective temperature is not a definite temperature at all, but rather an arbitrary index of the degree of warmth or cold felt by the human body in response to temperature, humidity and the movement of the atmosphere. This chart is developed from studies made by the Harvard School of Public Health in 1929. It will be noted that the comfort zone lies between 30 and 70 per cent relative humidity and 66 and 75 degrees effective temperature, with 71 degrees effective temperature as the line of ideal comfort conditions.

Table No. 1 shows the data computed with the aid of this chart, on the basis of a St. Louis home with an aver-

TABLE NO. 1. DISTRIBUTION OF GAS LOAD FOR A HOME FOR ALL PURPOSES
(Cubic Feet of 1000 B.t.u. Natural Gas)

	Heating Load	Cooking Load	Water Heating Load	Total	With Air Conditioning Dehumidification Load	Total
January	26,250	2,000	2,500	30,750	.....	30,750
February	20,750	2,000	2,500	25,250	.....	25,250
March	18,500	2,000	2,500	23,000	.....	23,000
April	8,125	2,000	2,500	12,625	.....	12,625
May	2,250	2,000	2,000	6,250	698	6,948
June	.....	2,000	2,000	4,000	3,769	7,769
July	.....	2,000	1,500	3,500	4,243	7,743
August	.....	2,000	1,500	3,500	3,492	6,992
September	750	2,000	2,000	4,750	1,742	6,492
October	6,875	2,000	2,000	10,875	.....	10,875
November	16,625	2,000	2,500	21,125	.....	21,125
December	24,875	2,000	2,500	29,375	.....	29,375
Total	125,000	24,000	26,000	175,000	13,943	188,943

age occupancy of five persons, assuming an hourly heat loss, on the base of 70 degree rise, of 48,000 B.t.u. This house would require for heating, with an average degree day deficiency of 4,457, an annual consumption of 125,000 cubic feet of 1000 B.t.u. gas. The air conditioning data was developed on the basis of a unit which would dehumidify to the point where the air would contain 5.1 grains of moisture per cubic foot, or a constant dew point of 56 degrees. The dehumidification load, as shown for the five summer months, varies with the days of operation and the moisture removed. It will be noted that this dehumidification load for summer air conditioning adds some 14,000 cubic feet of 1000 B.t.u. gas to the annual sales to each customer and improves the annual load factor approximately 5 per cent. If gas were also used for cooling in addition to humidification the possibility of levelling out the summer gas sales valley would be appreciably increased.

Air conditioning has been a slow development. There are many factors to be considered and much fool-proof apparatus to be developed. The first attempts in this direction did not involve the use of gas but as the development proceeds gas is entering more and more into the process and ultimately a very considerable usage may be expected.

Natural Gas to Carburet Blue Water Gas

USE of natural gas to carburet blue water-gas was discussed by two speakers before the Mid-West Gas Association annual convention at Omaha, Neb., April 15-17. C. D. Robinson, operating engineer for the Omaha Metropolitan Utilities District, discussed the District's use of natural gas to produce a finished gas having a heating value of 550 B.t.u. J. L. Eck, plant superintendent for the Minneapolis Gas Light Co., dealt with use of natural gas in Minneapolis to produce an 800 B.t.u. mixed gas.

Abstracts of both papers are offered below; Mr. Robinson's discussion brought out the following points:

During the summer of 1934 the Metropolitan Utilities District entered into a contract for a supply of natural gas to be used in lieu of gas oil for the enrichment of the carbureted water gas being supplied in Omaha.

Since it was thought that the extreme fluctuations in the quantity of gas used from minute to minute would cause the readings of an orifice meter to be almost illegible, a rate of flow controller and surge tank were installed at the gas works metering station.

The natural gas for enrichment is injected into the carbureter through a cast iron sleeve placed in the side of the carbureter near its top where the blue gas enters the carbureter. This is to permit the use at any time of the usual oil injecting equipment so that either natural gas or gas oil can be used simultaneously or separately.

The entire equipment at the works, as herein described, has worked from the very beginning with extraordinary smoothness and with entire satisfaction to the operators.

It was decided to increase gradually the use of natural gas for enrichment and make up the difference in the enrichment required by the use of gas oil. The use of natural gas equal to approximately ten per cent of the total gas produced was begun on November 6, 1934. This quantity was increased to twenty per cent on November 24th, to thirty per cent on December 8th, and to the final quantity, forty to forty-two per cent, on December 24th. At no time was either the heating value or the specific gravity of the gas changed materially from that existing prior to the use of natural gas for enrichment.

A comparison of typical analyses of the carbureted water gas enriched with oil and the blue gas enriched with natural gas as produced in Omaha is as shown in the following table:

	Oil Used for Enrichment	*Natural Gas used for Enrichment*
Carbon dioxide	6.2	3.8
Oxygen	0.8	0.6
Carbon monoxide	27.1	19.8
Methane	10.3	29.6
Ethane	0.0	0.0
Illuminants	10.5	3.0
Hydrogen	29.0	25.6
Nitrogen	16.1	17.6
Total	100.0	100.0
Heating Value	550-555	550-555
Specific Gravity	0.72	0.67

A careful record was kept of the number of customers' complaints which were received in November and December, 1934, in January, February and March, 1935, and the corresponding months of the winter of 1933-34, with results as shown in the following table:

	1933-34	1934-35
November	2652	3136
December	2812	3759
January	2710	4714
February	2102	3260
March	2708	4216

The causes of these complaints were entirely removed by re-adjustment of the appliances.

Tests indicated that while there is still sufficient water vapor in the gas it may be that the lack of condensable hydrocarbons will cause an increase in the leakage from the joints of cast iron mains and an excessive drying of meter diaphragms.

Two periods of low atmospheric temperature during the past winter caused a maximum flow through the distribution mains and were accompanied by a great increase in dust troubles. The flames of the range burners were as yellow as a luminous flame and numerous stoppages of service pipes caused by naphthalene and dust occasioned for these few cold days a rush of customers' complaints.

While it was thought that there would still remain sufficient odor to cause the presence of the gas to be easily detected, there have been some complaints on this score.

From the experience in Omaha the conclusion has been reached that where a 550 B.t.u. mixture of blue water gas and natural gas replaces a 550 B.t.u. water gas, carbureted with gas oil, it is necessary to both odorize and fog.

It may be of interest to show some of the operating results per thousand cubic feet of gas produced in January and February, 1934, when oil was used, compared with those in 1935 when natural gas was used as an enricher.

	1934	1935
Total Labor, man hours	0.0619	0.0502
Generator Fuel, pounds	27.91	19.53
Boiler Fuel, pounds	16.17	13.13
Gas Oil, gallons	3.18	.....
Natural Gas, cubic feet	.....	409

The gas makers and gas works operators prefer the natural gas to oil for enrichment purposes for the reason that the adjustments of the valves through which the natural gas is supplied to the sets are very infrequent compared with operation on oil.

THE Minneapolis experience, as described by L. J. Eck before the Mid-West Gas Association meeting, is summarized as follows:

The Minneapolis Gas Light Co. hitherto has served the city of Minneapolis and several suburbs with 550 B.t.u. water gas. In supplying these consumers with an 800 B.t.u. mixture of blue gas and natural gas the natural gas first passes through oil scrubbing equipment to remove any dust which may be present. The boiler room gas is then passed through a meter, a reducing regulator, on to the boiler burners.

The gas for enriching the blue gas is metered through a separate integrating

meter. The meter orifice differential is also used to control the addition of an odorant in such quantities as will insure the presence of sufficient odor in the gas after mixing. The gas is then delivered to a standard proportioning mixer, where it combines with blue gas at the city transmission pressure.

A by-pass is provided outside the mixing room where the gases can be mixed directly on the town using hand control. Another by-pass allows the gases to be mixed directly into a holder at low pressure.

The oil fog and steam for saturation are added at the outlet of the mixing equipment. Natural gas is used as sweep gas in the hot oil fogger.

The blue gas for dilution is stored in a 1-million foot holder from which the compressors take the gas which passes through the mixer. The mixer discharges into a large manifold from which four transmission lines operating at about 5 to 10 pounds gauge are fed. A 3-million foot storage holder at the plant is supplied with gas from this manifold for reserve storage. Any of the compressors can pump mixed gas from this holder and discharge into the manifold independent of the mixer operation.

To insure safe operation of the mixer, several devices have been provided. A pressure switch was installed on the natural gas line which, when set within the normal limits of pressure variation, will call any abnormal change to the engineer's attention. A similar switch has been installed on the city transmission line. A continuous gas-burning device, equipped with a photo sensitive cell, sounds an alarm within 15 seconds of a 10-B.t.u. deviation of the mixture.

The mixing proportioning valves are arranged in such a way that if the natural gas supply fails the blue gas will shut off. If the blue gas fails the natural will shut off. Thus one gas or the other cannot be sent out alone. The proportion of the gases mixed can be changed merely by turning a thumb nut. The mixer can handle 2 million feet per hour.

The water gas machines are equipped to make 800 B.t.u. gas if the occasion arises. It may be desirable to install such supply of butane as would be necessary to enrich the blue gas normally in storage. This would augment the supply while the gas machines are being fired up.

On days of high consumption, gas oil will be used in the sets to produce the peak gas necessary to avoid an excessive demand on the pipe line.

Cooperative Scheme for Leakage Survey

● R. W. MILLER, Hope Construction and Refining Co., Pittsburgh; addressing A.G.A. 12th Annual Distribution Conference, Cleveland, Ohio, May 2-4, 1935; topic "The Public Utility Survey Commission of Pittsburgh, Pa."—(Abstract by WESTERN GAS).

SYSTEMATIC gas distribution inspection, leak detection and subsequent repair operations offer somewhat of a problem in a municipality or community where only one gas company is concerned, with one well-planned distribution system. The difficulties of such work can well be appreciated where three distinct gas companies with separate organizations and separate systems are operating in one territory, as in Pittsburgh and the surrounding country.

The executives of the three gas companies and the Duquesne Light Co. in Pittsburgh, which desired to be associated with the three utilities in whatever leakage survey program was launched, organized in July, 1928, the Public Utility Survey Commission of Pittsburgh, Pa., operating under an executive committee, the actual direction of the commission itself being given to a gentleman from the Research Department of one of the utilities, who subsequently severed his connection with the gas company, to become entirely associated with the Mellon Institute, from whence the work is being carried on at present. Crew leaders, as well as the necessary laborers, are supplied in approximately equal numbers from the four utilities. Necessary automobiles, tools and supplies are also obtained from the companies concerned. Each utility pays 25 per cent of the total expenses of this commission.

The duties of the Commission are sixfold, namely:

(1) Regular inspection of all streets in the entire city and adjacent territory:

(2) Detection of any leaks at street openings or curb boxes;

(3) Actual location of pipe line or gas main leaks responsible for gas discovered at time of inspection;

(4) Preparation of maps or drawings to enable repair crews of the gas company concerned to effect necessary repairs;

(5) Attention to complaints, by customers of the so-called gas odor type, to those turned in by gas company employees, to those concerning carbon monoxide, and to the numerous miscellaneous ones having to do with gasoline, cleaner's naphtha, carbon tetrachloride, alcohol and crank case oil; and

(6) Training of men, who after service on the commission, are fitted to go out to smaller city plants to organize work of a similar nature. Men from other companies have also been trained by actual service with the commission.

To accomplish the foregoing, five crews of men are normally used, each crew consisting of its leader and from three to five others. The methods used by these crews are inexpensive, non-technical in nature and can be performed very satisfactorily by men not highly trained.

Crew No. 1, often called the Inspection Crew, operates continually in the entire territory, covering the district three or four times annually. It is the duty of this crew to inspect all curb boxes and street openings to discover any gas leakage. To date, irrespective of curb boxes, 582,058 street openings have been inspected, an average of approximately 400 per day. Experience has shown definitely that if leakage actually exists, it will be discovered at street openings or curb boxes. The chief piece of equipment is the Davey Safety Lamp, adapted for this particular work, by having placed below the burner, a two-piece metal base, the lower half of which carries a ½ inch nipple approximately 3 inches long, which can be inserted in ventilation openings in manhole covers or in bar holes. When it is not possible to use the safety lamp through manhole covers or gate box covers, due to a lack of ventilator openings, the cover is tilted and an observation made or, if the hole is deep, the cover is partially removed, the base removed from the lamp, and the lamp is lowered to various depths by means of a rope, a mirror often being used on the side of the lamp to observe the action of the flame. Should the lamp flame be extinguished, the lower half of the base pulls off, allowing the lamp operator to relight the flame in the usual fashion.

An effort is made to determine on the spot the approximate gas content of the mixture in the underground opening, which caused the Davey Lamp flame to be extinguished. To do this, a sample of the gaseous mixture is obtained in a quart narrow neck bottle, using a water displacement method. The following rapid and approximate method was devised by the commission to ascertain the gas content of the samples.

Samples of Pittsburgh natural gas and air were made up experimentally in quart bottles in percentages from 16% of natural gas and 84% of air to 100% of natural gas and no air. Water was allowed to flow from an aspirator bottle

at a higher level at a definite rate into each quart bottle, in whose neck was carried in a 2-holed rubber stopper a short length of glass tubing, of definite cross section. The mixture was lighted and the height of flame measured. For Pittsburgh natural gas, the length of flame varies from ¼ inch for 16% gas to 1¾ inches for 100% gas.

Mixtures of from 4 to 15% of natural gas are explosive, which can be easily ascertained. For percentages of natural gas below 4%, elongation of the Davey safety lamp flame is depended upon.

The crew carries an apparatus for making the above described flame test on the sample taken from the curb box or street opening. The character of the flame, so far as color is concerned, offers an indication as to the percentage of gas in the sample being burned, as does the existence of an inner cone when the flame is entirely blue. Those men making the tests become so experienced that it is possible to estimate the concentration without hardly referring to the flame height.

Prospecting Crews, Nos. 2, 3, 4, and 5 are furnished with the locations of those leaks discovered by the Inspection Crew, and the gas percentages. It becomes the duty of these crews to locate the leaks within their own territories, so that they in turn can furnish the repair crews with locations for excavation work. Barholes are now made at regular intervals over the gas lines with an air compressor wherever possible, generally in the four directions from the leak as reported by the Inspection Crew. After completing the barholes, these are tested with the safety lamp, and samples collected from those holes where the lamp has been extinguished. It is possible from the percentages revealed therein, to select a small group of barholes where the highest gas concentrations are encountered.

In addition to the work already discussed, the Survey Commission handles all gas odor and carbon monoxide complaints referred directly to the utilities by consumers, as well as leak complaints, received from both consumers and company employees. When engaged with this type of work, inspections are made both within and outside the customer's home, over sewer lines concerned and in nearby streets. Also, all public buildings such as schools, churches, theaters and hospitals are inspected at stated intervals, to insure that all house lines and gas burning equipment are in sound condition.

Vermillion (S. D.) Grants Franchise

Citizens of Vermillion, S. D., at a special election on May 21, voted to grant the Vermillion Natural Gas Co. a franchise for the distribution of natural gas in the community.

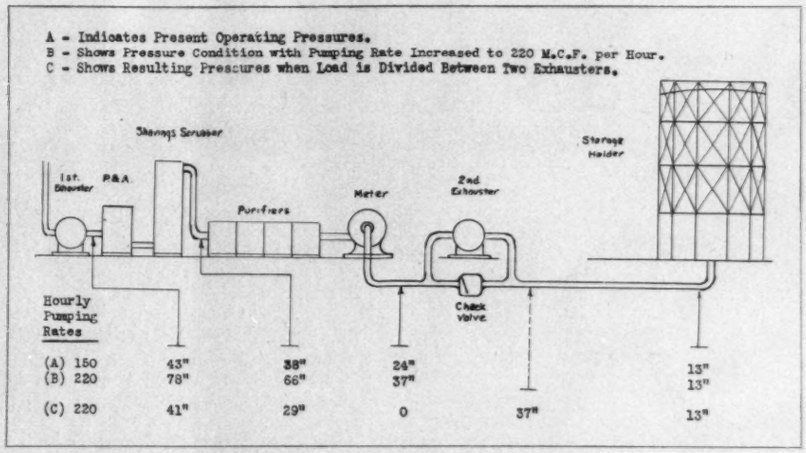

A - Indicates Present Operating Pressures.
B - Shows Pressure Condition with Pumping Rate Increased to 220 M.C.F. per Hour.
C - Shows Resulting Pressures when Load is Divided Between Two Exhausters.
Storage Scrubber
1st. Booster
P&A
Purifiers
Meter
2nd. Exhauster
Storage Holder
Check Valve
Hourly Pumping Rates
(A) 150 43" 38" 24" 13"
(B) 220 78" 66" 37" 13"
(C) 220 41" 29" 0 37" 13"

Fig. 1. Auxiliary exhauster to raise capacity without pressure increase.

Increasing Plant Capacity for Peaks

● **H. W. SCHELL, General Superintendent, Haverhill Gas Light Co., Haverhill, Mass.; addressing Operating Division, New England Gas Association, January 11, 1935—(Abstract by WESTERN GAS):**

CURRENT low rates for house heating do not appear to be sufficient to take care of plant extensions for peak sendouts occasioned by house-heating load. The necessity for building up plant capacity at low investment cost developed the following completed and projected expedients at the Haverhill plant.

Blast Equipment: Insufficient blast equipment led to an investigation of blower problems and disclosed that the blast capacity of the most important unit could safely be increased 50 per cent by installing a new air fan-wheel of late design together with an increase in the number of turbine steam nozzles and some minor changes in turbine governor parts. This work could be done at the cost of a few hundred dollars as compared with several thousand dollars for a complete new unit.

Condenser Equipment: Two condensers could not be pushed for greater duty, even with excess cooling water available, without water running over the tops. Larger overflow lines would have been expensive to install. The difficulty on both condensers was remedied by closing in the existing overflow lines so that the water column in them exerted a pull at the overflow level rather than a gravity run-off.

Purifiers: Existing purifying equipment consists of four cast-iron boxes, originally with water-seals suitable for 23 inches operating pressure. Changing water-seals to dry seals with clamp-down covers, together with a few other minor changes, principally lengthening all seals along the pumping line, made it possible to increase the pumping rate 50 per cent.

Pumping Capacity: The overall capacity of the plant is 3 million cubic feet daily. On peak demand the gas generating capacity is 4 million cubic feet, but the capacity of purifiers and piping makes it very difficult to get this additional million cubic feet into storage; additional exhauster capacity installed in the usual way is not the answer because the present cast-iron purifier boxes are now operating at maximum safe pressure. It is proposed to install an additional exhauster on by-pass in the pumping line immediately after the purifiers so that the new unit will drop the pressure to 0 inches of water at its inlet. This will divide the load between the two exhauster units, maintain present operating pressure on the boxes and effect a substantial increase in flow of gas so that the excess generator capacity can be utilized. A schematic drawing of this installation is shown in Fig. 1.

Booster Installation: In spite of somewhat liberal storage capacity there have been times when holders uncupped to a point where low pressure resulted in the distribution system. To obviate this, a turbine driven booster was installed ahead of the balance and station governors and placed on a by-pass so that in such an emergency the booster could maintain full holder pressure at the governor inlet at all times. All the holders can now be pumped to the ground if necessary. This not only guarantees in some measure the service rendered, but in effect also is a substitute for generating capacity for peak loads.

United's "Handy Hot" Campaign

AN automatic storage water heater campaign, conducted by the United Gas System in cooperation with dealers in the territory, and employing only the commonly used sales inducements, netted in excess of 2,200 units during February and March of this year. The campaign ran for an eight-week period, with an extra week allowed for installation of heaters sold during the closing days of the activity.

The results of the campaign reflected the carefully laid plans of the Distribution Sales Department to enlist the interest and support of all company employees, as well as to stimulate active participation on the part of every water heater dealer in the communities served by the company.

In laying out the program, prices and terms of water heaters offered by the company were established on such a basis that dealers did not feel they would be handicapped in the sale of their equipment. Arrangements were made so that dealers who so desired might sell the featured company water heater at the same prices and terms as the company. The financing of these latter sales was handled by the manufacturer. However, dealers were encouraged to push the line of water heaters which they handled regularly, rather than to sell the water heaters offered by the company. Bonuses were paid to dealers on the sale of A.G.A. approved type gas-fired storage automatic water heaters (except sale of a company stocked heater) where the prospect was secured and the sale consummated without any actual assistance from company employees.

Campaign prices and terms on company stocks for the period of the campaign were 5 per cent discount from regular prices, terms up to 24 months, with a nominal trade-in allowance of from $5 to $10 for old heaters in actual use at the time a sale was made. The trade-in allowance was not credited on the down payment, but was used to decrease the amount of the monthly payments.

Company employees, other than those engaged in sales work, were allowed a bonus on all prospects turned in which resulted in a sale of an approved type gas water heater, either through the company or through a dealer. Salesmen's accomplishments were judged by the E.A.R. produced, and therefore they had as much incentive to assist in dealer sales as to consummate sales for the company. The program outlined definite activities for each class of employee, including local representatives, home economists, and salesmen.

To personalize and humanize the campaign, the name "Handy Hot" was selected. It was symbolized by the running figure of a small boy, carrying a miniature heater which shot forth a cloud of steam along his trail. Transfer stickers carrying the "Handy Hot" trade mark design were affixed over the manufacturer's name plate on the water heaters so that they were sold as "Handy Hot" appliances. Dealers were also allowed the privilege of using these stickers on their own heaters in order to identify their appliances with the campaign.

As soon as plans were completed, an outline of the campaign, giving complete details of gas company assistance to dealers, the advertising program, prices, terms, quotas, etc., was prepared. District sales supervisors began their contacts to explain the program and to urge dealers to have stocks on hand for the opening of the campaign.

Another outline detailing the campaign from the company standpoint was prepared and distributed to all employees. Each district prepared a list of prospects to be used when the campaign opened.

The Handy Hot Campaign was announced to the general public through a series of "teaser" advertisements starting three days before the campaign opened. Newspaper advertisements were used regularly throughout the campaign. Other forms of advertising used were direct mail campaign to selected prospects; broadsides for individual mailing by company employees; window and floor displays; truck banners; tire covers, and other miscellaneous items. All advertising played up the dealers' part in the program equally with that of the company. To keep employees' interest at a high pitch, competition between districts for prizes was based on a series of weekly "basketball" games, with the sales being tabulated as basketball scores.

When the campaign closed, 2,192 water heaters had been sold and installed. This figure represented 37 water heater sales per thousand residential customers. Approximately 30 additional sales had not been installed because of construction or repair work in the homes in which they were to be placed. Water heater dealers were credited with a little over 48 per cent of the water heaters sold. Of the total sales made by dealers, 37 per cent were the featured water heater, and the balance were hot water appliances which the dealers sold regularly.

The campaign did a great deal to further the company's program of coordinated selling. One of the most gratifying results from the company standpoint was the fact that around 70 per cent of the sales represented new water heater installations.

C. Lee Wood, General Manager of Houston Pipe Line Co.

C. Lee Wood, formerly auditor and assistant treasurer of Houston Pipe Line Co., has succeeded Frank W. Kirk as general manager of the organization. Mr. Kirk, who was with the company from its inception, as general superintendent and later general manager, has retired due to ill health.

Mr. Wood still retains his title of auditor and assistant treasurer, though he has been acting general manager since May, 1934, and his appointment as general manager became effective in March of this year. He came to the Houston Pipe Line Co. in May, 1925, having filled executive positions with the War Finance Corp. and other organizations in Colorado and Montana in his earlier business career.

Natural Gas Co., Inc. Moves To New Location

Natural Gas Co., Inc., Monroe, La., has moved to new quarters in the Woodmen of the World Bldg., at Jackson and Harrison Sts., on which the company has secured a 10-year lease. C. A. Prophit is manager of the company. The building has been entirely remodeled, only portions of the old building retained being the roof and outside walls. The brick structure has been stuccoed and plate glass fronts installed on two sides.

Pecos Valley Gas Co. Completes New Line

The Pecos Valley Gas Co., Artesia, N. Mex., has completed its 6-inch 18-mile natural gas pipe line linking Carlsbad to the Jal, N. Mex., gas field. The new line will augment a 6-inch line from the Artesia gas field from which Carlsbad has been getting its supply. Artesia is now supplied through the new line from the Jal field via Carlsbad.

Natural Gas group at cabaret banquet and dance, held at Hotel Peabody, Memphis, May 8.

Best Attendance in 5 Years Reached at Memphis Natural Gas Convention

By GEORGE H. FINLEY
Editor, WESTERN GAS

TURNING out in greater number than for any convention since 1931, natural gas men of the nation made the A.G.A. Natural Gas Department's annual Spring Meeting at Memphis the most constructive affair in the Department's history. Attendance reached 1,000 before the May 6-9 sessions were concluded. From a program standpoint it was the concensus of opinion that the meeting exceeded any previous natural gas convention in value—a tribute to the careful planning done by Chairman John B. Tonkin, Vice Chairman Wm. Moeller, Jr., Department Secretary A. E. Higgins, and their corps of committeemen.

Parallel sessions on the afternoons of two days brought specialized attention to a variety of technical and commercial subjects and left the general sessions free for headline topics of common interest to all present—an innovation which made the convention of extra value.

On the opening session program Chairman Tonkin, A.G.A. President Percy S. Young, and Managing Director Alexander Forward were all heard in brief addresses.

Resuming a custom which has languished since the 1929 meeting, the Department at its opening session paid tribute to the memory of the several score natural gas men who have passed from its ranks. The impressive "in memoriam" was conducted by W. C. Grant.

General Session Headliners

A paper prepared by R. W. Gallagher and presented to the opening session by Frank H. Lerch, Jr., opened up the broad subject of taxation and legislation. Mr. Gallagher's message surveyed the trend toward increasing legislative curbs on natural gas utilities, offering in evidence bills proposed before state legislatures of the past session—bills to lay taxes ranging from 5 to 10 cents per M c.f., bills to perpetrate severance taxes, bills to prevent merchandising, etc. Fortunately the rate of mortality on these bills is high, but they indicate that the natural gas industry is gaining favor as a political target.

Determined political thrusts at utilities—in the face of the general high standard of service maintained—can only mean that there is lack of common viewpoint between the utilities and government, said Mr. Gallagher, concluding in these words: "I consider it to be the most important duty of public utility management in the next few years to sit down with representatives of Government and to create a mutual understanding of the problems involved in best expanding and maintaining public utility service."

Important convention actions included a vigorous resolution which condemned the Wheeler-Rayburn Bill in the following language:

Because the pending Wheeler-Rayburn Public Utility Act of 1935 proposes to abolish holding companies, and in the meantime to regulate not only the holding companies that may be interested in the natural gas business, but the operating companies as well; and,

Because the proposed legislation goes far beyond control of public utility holding and operating companies, since non-utility companies having substantial interests in the natural gas business would be subject to the Bill; and,

Because of the problems peculiar to the natural gas business it is impractical to attempt to deal with those problems in conjunction with the electric utility industry, as is proposed in the Bill; and

Because it is premature to attempt to regulate the natural gas industry without basing such regulation upon full knowledge of its peculiar operating and financial problems; and

Because an investigation by the Federal Trade Commission to that end now in progress has not been completed;

Be It Resolved by the Natural Gas Department of the American Gas Association in Convention assembled, at Memphis, Tennessee, that the passage of the Wheeler-Rayburn Bill as it affects the natural gas industry would be disastrous to that industry and would be against the public interest.

The foregoing resolution was placed before the convention by Frank L. Chase at the request of the Department Managing Committee.

Another resolution of entirely different tenor was offered by Mr. Chase and unanimously voted, conveying the natural gas industry's appreciation to the Bureau of Mines for its unfailing cooperation extended the industry for many years past. Dr. John W. Finch, director of the Bureau, was on the May 8 general session in an address devoted to Bureau services and stressing the vital need for natural gas conservation.

Reports of main Department committees were introduced by H. C. Cooper, chairman of the Main Technical and Research Committee, at the second general session, May 7. Three reports were offered concerning data which will be available to the industry in printed form within a few weeks. The report of the Gas Measurement sub-committee (F. R. Weymouth, chairman) dealt with the new orifice meter data developed in cooperation with the A.S.M.E. and Bureau of Standards. Results of this important research project, extending over the past 10 years, will be made available as a Bureau of Standards publication, and when released shortly may be secured either through the Bureau or the American Gas Association.

The report of the Gas Well Deliveries subcommittee (N. C. McGowen, chairman), will be printed as a Bureau of Mines publication, and that on the Pressure Piping Code of the

A.S.M.E. when printed shortly will be available from the A.S.M.E.

In addition to the above reports the subject of geophysics had a place on the Tuesday general sessions program, three speakers dealing with modern test methods for location of gas structures and extent of fields.

Natural gas reserves and their conservation appeared also on the third general session when Ralph E. Davis gave the subject treatment from a national aspect. R. E. Wertz dealt with wastage in the Panhandle field, and A. F. Bridge in a paper read by Wm. Moeller, Jr. presented California's experience in reducing wastage to a minimum. Mr. Davis presented the following estimate of known gas reserves, including in the figures his estimate of probable reserves that will be developed in fields now productive:

	Billions of Cubic Feet
Appalachian Fields	7,000
North Central States	100
Mid-Continent and Gulf Coast Fields	47,000
Rocky Mountain States	2,000
California	5,000
Total	62,000

The total of 62,000 billion feet compares with a present rate of annual consumption of 1,750 billion cubic feet.

Ed. C. Connor in a paper collaborated in by P. McDonald Biddison, dealt with common carrier obligations as applied to natural gas transmission lines, and demonstrated clearly that imposing a common carrier status upon such lines would make it impossible for them to effectively discharge their present public service obligations.

Air conditioning was another general session topic of high interest. The leading discussion, by George M. Parker, is abstracted in this issue of *Western Gas*. C. A. Breitung, contributing to the discussion, emphasized the health appeal of air conditioning and urged that first sales effort be thrown in this direction. He also urged that the industry take air conditioning under its wing in its present stage of development, without expecting perfection in equipment. Only by this route can volume sales be built, costs be lowered, and improvement in products be reached.

"Whole Organization Attention to Sales" by E. M. Tharp, and a second paper on the same topic by S. B. Severson, put the general session spotlight on possibilities which lie in using a gas company's entire manpower to further load-building programs.

Parallel Sessions

For the purpose of the parallel sessions topics to be discussed were grouped under three general heads—distribution, sales and utilization — natural gas production — and transmission and compression. In addition there was an industrial gas conference which occupied an entire afternoon with general exchange of experience on industrial problems.

Two sessions of the distribution-sales-utilization group were held, presided over by J. V. Strange and W. C. Grant, respectively. Meeting government-sponsored competition, gas hair dryers, modern advertising for sales, gas engines for power, and dealer cooperation were topics of particular interest to commercial men present. F. M. Rosenkrans, chairman of the A.G.A. Commercial Section, also brought a report on the national refrigeration and range sales contests.

R. W. Hendee presided over the natural gas production group meeting, at which natural gas storage methods, cementing practices, directional drilling, and bottom hole chokes were discussed under the general head of control of gas wells.

Under the transmission and compression session, for which Elmer F. Schmidt acted as chairman, came discussions of modern methods in dehydrating high pressure natural gas, compressor station operation, pipe line corrosion survey work, and reconditioning pipe lines.

Several of the parallel session papers will be abstracted for the benefit of *Western Gas* readers in future issues. The paper by B. L. Rogers on improvements in the technique of compressor station operation is published this month in full, while A. B. Allyne's paper on dehydration of high pressure natural gas and that by M. L. Kapp on dealer cooperation will be covered next month.

Entertainment phases of the Memphis convention left nothing to be desired, the cabaret banquet and dance on the night of May 8 being the highlight.

Much credit for the success of the meetings is due the Memphis Power and Light Co. and Memphis Natural Gas Co. W. J. O'Brien of the former company was chairman of the general arrangements committee, assisted locally by J. J. Brennan in charge of hotel and entertainment arrangements, Frank Libbey in charge of transportation, and Mrs. O'Brien as hostess.

Hotel Peabody provided an excellent setting for business and social activities, with F. R. Schutt, vice-president and general manager of the hotel, doing all in his power to make the natural gas men's stay enjoyable.

Regular Spring Meetings

Decision of the Department Managing Committee was reached at Memphis to continue the annual Spring Meeting, dating it between May 1 and May 15. Location of the 1936 session will be announced at the Atlantic City A.G.A. convention in October, at which time next year's officers for the Department will also be elected.

Lone Star Pipe Lines Defy Flood Waters Successfully

Lone Star Gas Co.'s pipe line bridges were never before simultaneously assaulted by flooded conditions as they were during recent floods throughout the state. Hammered and smashed by waves, 200 feet of Fish Trap road bridge across Lake Dallas were bobbing up and down, held in place only by a 6-inch welded steel pipe gas line which supplies McKinney. Lone Star men were stationed at each end of the bridge ready to cut off the line if the pipe broke. Between Oklaunion and Davidson Okla., several hundred feet of highway bridge were washed out, leaving Lone Star's 6-inch pipe line unsupported in midstream. The pipe was steel welded and held, despite the raging waters. The Brazos River south of Waco exceeded any previous high water mark and endangered the company's pipe line bridge with floating logs and debris.

Dealer Outlets on Increase for United Gas System

United Gas System's program for cooperating with dealer outlets, which has been under way for about a year and a half, has progressed to a point where it includes 492 dealers in the company's extensive territory. This includes southern Mississippi, southern Louisiana and Texas, and numbers approximately 150 towns ranging from less than 100 to 10,000 meters each.

In immediate charge of both direct sales and dealer contracts the company employs four sales supervisors located at strategic points and reporting to Dean Strickland, distribution sales manager for the company.

New Building to House P. G. & C. Oregon City Quarters

Construction of a new building in Oregon City, Ore., half of which is to be occupied by district offices of the Portland Gas & Coke Co., is scheduled for an early date. The front of the building will be finished in fine white brick, with large plate glass windows. Gas lighting will be used to illuminate the building at night.

Portland Gas & Coke Co. quarters will have a 20-foot frontage and extend 90 feet along the alley. The new location will include a salesroom and warehouse, as an extensive line of modern gas appliances will be merchandised, according to C. W. Nash, manager of the district.

Cooking Demonstration Live Feature of Office Opening

A sales floor cooking demonstration by Albertine Berry, home economics director for the Lone Star Gas System, was a very successful feature of the Municipal Gas Co.'s housewarming at its Wichita Falls, Texas, office during the first week in May. Hamburgers cooked on a modern gas range were served to 336 people the first day of the demonstration; gingerbread was the attraction on the second day and cookies on the third and final day. The cooking demonstration was an excellent tie-in with a floor display of ranges. Local manager at Wichita Falls is J. B. Price.

Refrigerating Data Book Catalog Published in Second Edition

The American Society of Refrigerating Engineers, 37 West 39th St., New York, N. Y., recently brought from the press its Second Edition of the "Refrigerating Data Book and Catalog," for 1934-36. David L. Fiske, as editor, headed the Data Book Committee of 11 appointed by the American Society of Refrigerating Engineers to compile the volume.

In addition to 234 tables, individual sections of the 576-page publication include such subject matter as climatic data, refrigerants, and materials in the fundamental data section; principles of thermodynamics, psychrometry, and heat transmission; refrigerating machinery and equipment; applications of refrigeration, including air cooling and

conditioning, brewery refrigeration, cold storage plants, food freezing, ice manufacturing, low temperature applications, dairy products and ice cream.

Of interest also in the book is the refrigerating glossary, an advertising catalog and index by products, a directory of distributors, and a membership list of the American Society of Refrigerating Engineers. The volume sells for $3.50 per single copy in the United States; elsewhere $4.00.

Results of Cooperation

(Continued from Page 15)

of all financial recourse under this plan, making it possible for large and small dealers alike to make equal use of the gas company financing offer. Larger dealers came into the program reluctantly, feeling that business was being thrown to their smaller competitors through the company's financing assistance.

It would appear that smaller dealers would be unanimous in their appreciation of the aid offered. Yet there were some master plumbers who held out on the plan because all water heater sales would not be routed through members of the state association—a point which the gas companies naturally would not concede. Obviously, such a request proceeds from fear that water heater sales under the financing plan may go to others than plumbers. On this point Mr. Banks stated that while gas companies have no desire to change trade channels, plumbers should expect to justify their share of the business by the activity they put on retaining it. While doing everything within the limits of sound policy to aid plumbers to hold water heater business, gas companies are determined to see that the replacement market and the non-automatic water heater market are given a thorough working—preferably by plumbers, but if not, then by other agencies.

The net impression left by Mr. Banks' talk was that cooperation is a two-sided affair, and that in all too many cases the gas company is getting less appreciation for its efforts than the large measure of dealer assistance rendered would seem to call for. Undoubtedly the situation is vastly improved from that of a few years past, and the increasing volume of dealer sales attests the fact. However, more results and less friction would follow from a broader view of the problems which enter into maintaining a dealer cooperative program. Dealers with an eye on their appliance profits are fast acquiring an ability to see a situation from all angles, including the gas company viewpoint. For that matter, gas companies can still stand a lot of education in dealer problems. And both branches will be more tolerant if they admit that fresh problems will always present themselves for open-minded solution.

Raymond W. Baker Passes

Raymond W. Baker, former vice-president and general manager of the Welsbach Co., Gloucester, N. J., passed away on May 9 in Woodbury, N. J. He resigned from the Welsbach Co. April 1, 1934.

M. I. T. Tests Show Economy of Gas for Water Heating

AN extremely interesting series of tests has just been announced by the American Gas Association, based on an investigation just completed at the Massachusetts Institute of Technology, under the direction of Gordon B. Wilkes, Professor of Heat Engineering. This investigation, covering a period of nine months, consists of complete tests on 25 water heaters and water heating methods. These tests were made to conform as nearly as possible to actual household conditions, and were all run on exactly the same basis in the same laboratory by the same staff, so as to be strictly comparable.

These data have been summarized and prepared in convenient form for gas company use by the M. I. T. Water Heater Tests Sub-Committee (C. H. Light, Peoples Gas Light and Coke Co., Chairman) of the 1935 A.G.A. Water Heating Committee. Looseleaf sheets will be provided, 7 in. by 10 in., each sheet dealing with one type of fuel, and carrying the individual gas company's name, the local gas rates, and local competitive fuel prices. It is intended that these sheets should be furnished to salesmen who would, in turn, give to their prospect the gas fuel sheet and the sheet appropriate to his present method of water heating.

These are sold in units of 50 sheets, a unit for each fuel. The cost of these sheets, as computed, printed and furnished by the A.G.A., is $5.00 for the first unit and $4.00 for each additional unit. A pamphlet describing these sheets and all details of the plan, entitled "The Cost of Heating Water for Domestic Use", can be obtained from A.G.A. Headquarters.

A summary of the data follows:

BASIS: All heaters tested are those normally recommended for a six-room house, housing five people, using 50 gallons of hot water per day normally, or 1,500 gallons per month.

GAS AUTOMATIC HEATERS—COST FIGURES

	Consumption Cubic Feet	Cost with 85c/M Gas
1. *Heater I:* Average gas used per month—cu. ft. (530 B.t.u.)	3460	$2.94
2. *Heater II:* Average gas used per month—cu. ft. (530 B.t.u.)	3670	3.12
3. *Heater III:* Average gas used per month—cu. ft. (530 B.t.u.)	3790	3.22

ELECTRIC STORAGE HEATERS—COST FIGURES

	Consumption	Cost with 1c Electricity
1. *Heater I:* Average electricity used per month—KWH	491	$4.91
2. *Heater II:* Average electricity used per month—KWH	426	$4.26

These figures cover *bare fuel costs only* and assume all energy used would be at the 1c rate.

OIL BURNER—COST FIGURES

	If Storage Tank is		Cost with 7½c oil—4c elec.	
Winter	*Insulated*	*Uninsulated**	*Insulated*	*Uninsulated**
Average oil used per month—gallons	19.8	25.82	$1.48	$1.94
Average electricity used per month—KWH	1.5	2.0	.06	.08
Bare fuel cost for average winter month			$1.54	$2.02
Summer				
Average oil used per month—gallons	85.2	114.9	$6.39	$8.62
Average electricity used per month—KWH	5.2	7.05	.21	.28
Bare fuel cost for average summer month			$6.60	$8.90

	Per Month		Total Cost	
Annual Basis:	*Insulated*	*Uninsulated**	*Insulated*	*Uninsulated**
Winter—7 months @	$1.54	$2.05 =	$10.78	$14.15
Summer—5 months @	6.60	8.83 =	33.00	44.40
Bare fuel cost per year			$43.78	$58.55
This equals an average monthly cost for bare fuel only of			$ 3.65	$ 4.88

OIL DESIGNED FURNACE—COST FIGURES

	If Storage Tank is		Cost with 7½c oil—4c elec.	
Winter	*Insulated*	*Uninsulated**	*Insulated*	*Uninsulated**
Average oil used per month—gallons	37.5	42.4	$2.82	$3.18
Average electricity used per month—KWH	2.6	2.9	.10	.12
Bare fuel cost for average winter month			$2.92	$3.30
Summer				
Average oil used per month—gallons	45.6	60.3	$3.42	$4.52
Average electricity used per month—KWH	9.9	13.1	.39	.52
Bare fuel cost for average summer month			$3.81	$5.04

	Per Month		Total Cost	
Annual Basis:	*Insulated*	*Uninsulated**	*Insulated*	*Uninsulated**
Winter—7 months @	$2.92	$3.30	$20.44	$23.10
Summer—5 months @	3.81	5.04	19.05	25.20
Bare fuel cost per year			$39.49	$48.30
This equals an average monthly cost for bare fuel only of			$3.30	$4.03

COAL-FIRED BOILERS—COST FIGURES

	If Storage Tank is		Cost with $14.00 Coal	
	Insulated	*Uninsulated**	*Insulated*	*Uninsulated**
1. *Indirect Heater:* Average coal used per month—lbs.	381	438	$2.67	$3.07
2. *Furnace Coil:* Average coal used per month—lbs.	378	435	$2.65	$3.04

These are average monthly costs during Winter and are *bare fuel costs* only. Other means for heating water must be utilized in Summer.

(See next page for data on coal-fired water heaters)

COAL-FIRED WATER HEATERS—COST FIGURES
(Pot type or bucket-a-day heaters)

	If Storage Tank is		Cost with Coal @ $12.00/ton	
	Insulated	*Uninsulated**	*Insulated*	*Uninsulated**
1. *Heater I:* Average coal used per month—lbs.	714	749	$4.28	$4.48
2. *Heater II:* Average coal used per month—lbs.	630	662	$3.78	$3.97

These are average monthly costs during twelve months and are *bare fuel costs* only.
* Calculated by Professor G. B. Wilkes from tests on insulated tanks.

D. A. Hulcy

Elmer T. Schmidt

Roy C. Coffee

Marshall Newcomb

New Executive Appointments for Lone Star Gas Corp.

L. B. DENNING, president of Lone Star Gas Corp., announced in May the appointment of D. A. Hulcy of Dallas, Tex., as vice-president and member of the board of directors of the corporation, to fill the vacancy made by the recent death of Karl F. Griffith, vice-president and general counsel. Mr. Hulcy has been assistant to the president since 1929.

Mr. Hulcy is a native of Texas and has advanced through various accounting and auditing positions to his present appointment. In 1920 he joined the Lone Star Gas organization in the plant and equipment section of the accounting department, later advancing to chief clerk of the producing section of the same department. In 1924 he became chief clerk of the entire accounting department and in 1927 was named assistant comptroller of the corporation. From this position he was advanced to assistant to the president in November, 1929.

Mr. Hulcy also is secretary and comptroller of the Northern Natural Gas Co., which operates a natural gas pipe line from the Texas Panhandle to Minneapolis and intervening cities.

Elmer T. Schmidt, superintendent of the Lone Star Gas Co., has been elected a member of the board of directors of the company. He was born in Binghampton, New York in 1889, graduated from Cornell University as a civil engineer in 1912, and joined the engineering department of the Ohio Fuel Supply Co. at Charleston, W. Va., where he completed two outstanding inventory surveys for the Toledo, Ohio, property of the company, and for the Fayette County Gas Co. of Uniontown, Pa., and later became a member of the staff of the Ohio Fuel Supply Co. engineering offices at Columbus, Ohio, where he entered the gas measurement division. In this activity he assisted in developing the specific gravity balance and the mercury differential recording gauge, types now predominant in the natural gas industry. Mr. Schmidt joined the Lone Star Gas Co. in Fort Worth in 1918 when there were not more than 12 people on the general office staff.

Roy C. Coffee, attorney for the Lone Star Gas Co. since 1926, has been appointed general attorney and member of the board of directors. Mr. Coffee is a graduate of the law school of the University of Texas and is a member of the Dallas and Texas bar associations. An Arkansan by birth, but a Texan by adoption, he served four years in the Texas legislature, and was assistant district attorney of Wise County before accepting a position with the Municipal Gas Co. at Waxahatchie, Texas.

Marshall Newcomb, a member of the Lone Star Gas Co. legal department since 1928, has been appointed assistant general attorney. Mr. Newcomb was born in Austin, Texas. He was on the civil district attorney's staff in Dallas for 15 months and in 1927 entered the tax department of the Lone Star Gas Co., being admitted to the bar and transferred to the legal department of the company in 1928.

Lulu Tregoning to Direct Home Service at Kansas City Gas Co.

Effective May 13, the Kansas City (Kan.) Gas Co. appointed Miss Lulu Tregoning as home service director, under the direct supervision of Herbert C. Porter, new business manager. Miss Tregoning holds a B.S. degree in home economics from Iowa State College at Ames, and took a two-year post graduate course at the University of Chicago. She has had considerable teaching experience, and for six months traveled in Europe studying foreign kitchens, foods and menus. Following her stay in Europe she was foods nutrition and equipment specialist for Iowa State College, and during the summer of 1934 traveled throughout the seven middle-western states in the Skelgas Co.'s model traveling kitchen.

Gas Househeating Trend Upward in Portland Area

Portland Gas & Coke Co. reports a total of 208 major gas heating appliances, including furnaces, boilers and conversion burners, sold the first four months of 1935, compared with 8 for the corresponding period of 1934. Total 1934 sales of this type of appliance amounted to 176.

The upward trend in the use of the major gas heating appliances has been credited to the quantity rate offered by the company, adaptability of the conversion burner at small cost, and increased activity in the sales department.

The company also reports more Electrolux sales the first four months of 1935 than the whole of 1934.

Pacific Gas and Electric Co. First Quarter Profits Up

Net profits of the Pacific Gas and Electric Co., San Francisco, Calif., for the first quarter of 1935, has been reported at $4,521,223 compared with $3,992,100 for the similar period of 1934.

Gross revenue of the company for the first three months of 1935 amounted to $22,826,927, an increase of $1,252,768 or 5.8 per cent over the same period of 1934. This is the largest gross reported by the company for any quarter since 1932.

Total operating expenses, including depreciation reserve were $12,987,557, an increase of $506,121 over 1934.

Exposition Range Regatta Contest Opens in So. Counties Gas Co.

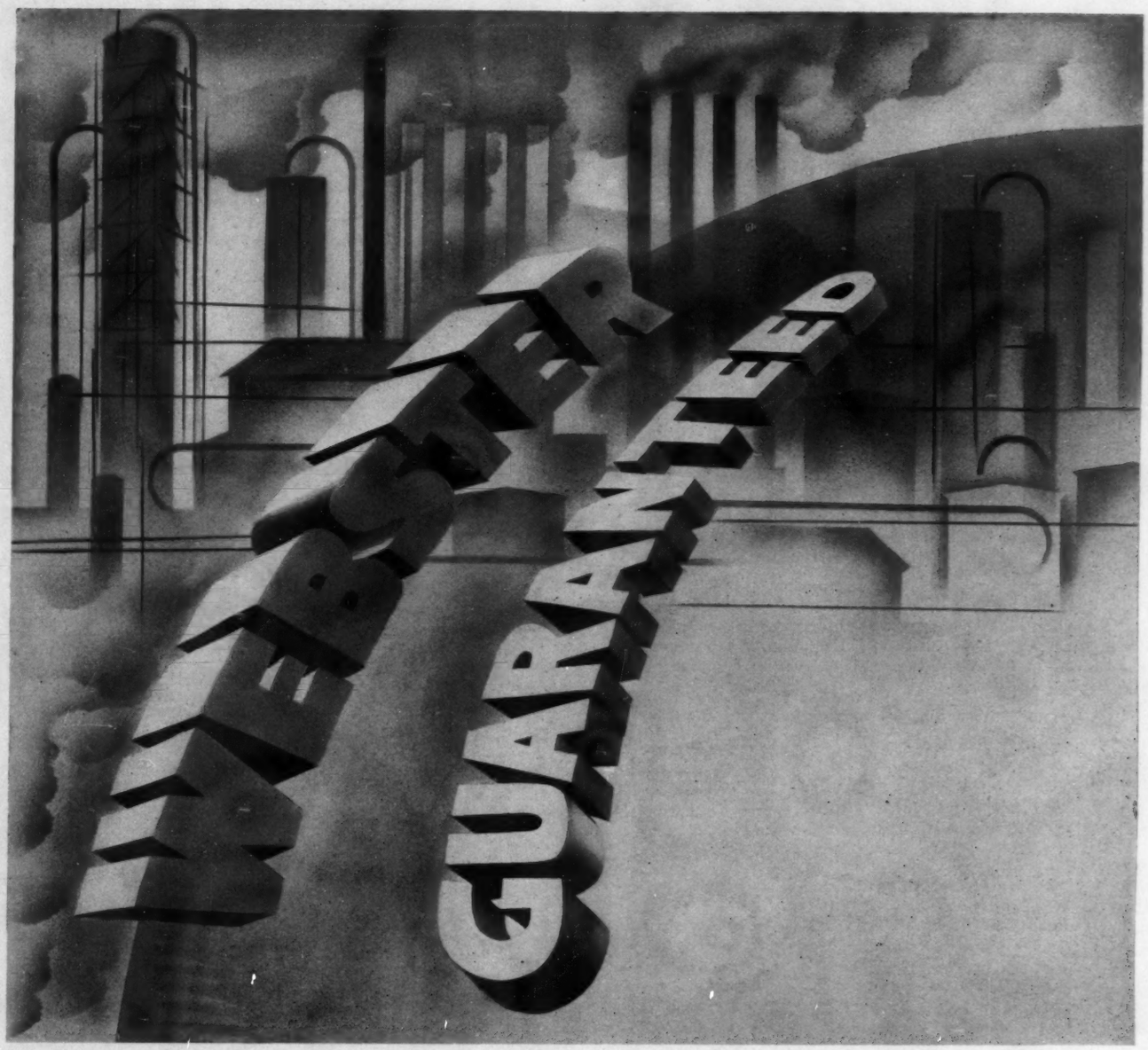
Southern Counties Gas Co., Los Angeles, Calif., on May 10 opened a 7-weeks gas range contest known as the "San Diego Exposition Range Regatta," in which only A.G.A. approved gas ranges will be featured. Twenty-five salesmen have entered the contest, according to Clyde H. Potter, commercial manager. The Regatta winner is to be awarded $50 and two admission books to the California Pacific International Exposition in San Diego. A second prize of $25 and 2 admission books to the Fair will also be awarded.

Southern California Gas Co. Shows Increase

Southern California Gas Co., for the 12 months ending March 31, 1935, shows an income balance of $1,975,448, after all charges including taxes, interest, depreciation and amortization, compared with $1,783,009 in 1934. Total gross revenues for the period increased $655,997 or 4.6 per cent over the preceding 12 months. Operating expenses increased $580,994 or 7.9 per cent. Taxes were higher, amounting to $1,756,993, compared with $1,676,086.

Garlock Represents Glenwood

M. E. Garlock has been appointed California representative for the Glenwood Range Co. of Taunton, Mass. The Los Angeles office of the company is located at 440 Seaton Street.



MAINTAINING LEADERSHIP

THE WEBSTER ENGINEERING COMPANY
QUALITY EFFICIENCY SERVICE with SPEED

● **This organization has always developed only the most efficient type of equipment for the Gas Industry. With burner efficiency of 97% to 99% we realized that the need in the industry was for a better method of applying this equipment. Maximum overall burner and furnace efficiency should be maintained after the equipment had been installed. In line with our policy of maintaining leadership we developed a combustion control that maintains the highest possible efficiency under all load conditions. This control . . . the WECO COMBUSTION CONTROL . . . is extremely accurate, flexible, and moderate in price. Thoroughly and definitely proven, it has the acceptance of major Gas Companies and is entering its second year of successful operation. It makes users satisfied; assures maximum efficiency.**

Send us your combustion problems and permit us to make our recommendations and guarantees.

The WEBSTER ENGINEERING COMPANY

Division of Surface Combustion Corporation—Sales and Engineering Service in Principal Cities

The artist's sketch presents "Casa de Tempo"—an all-gas home at the San Diego Exposition. Gas exhibits of companies and Pacific Coast Gas Association Manufacturers' Section are located in the Palace of Better Housing.

Gas Well Represented at California Pacific International Exposition

WITH San Diego playing host to the world in its "California Pacific International Exposition," which opened on May 29 to extend until November 11, a little information is timely on representation for gas at the Exposition.

Gasco and P.C.G.A. Exhibits

San Diego Consolidated Gas & Electric Co., and Southern Counties Gas Co., which supplies the natural gas for distribution by the San Diego utility, are sponsoring a joint exhibit in the Palace of Better Housing—one of the permanent exposition structures at Balboa Park. In the same building, adjoining the gas company exhibit, the Pacific Coast Gas Association through its Manufacturers' Section has engaged space for another appliance display.

Each of these two exhibits will occupy about 1,000 square feet. The cooperative gas company exhibit will feature a modern kitchen, with an ideal setting for displaying domestic gas equipment. Cooking demonstration features are planned in connection with this exhibit, which will be manned by attendants provided by San Diego Consolidated Gas and Electric.

A. E. Holloway for the San Diego company, and N. R. McKee for Southern Counties Gas Co., are in general charge of the cooperative exhibit, while Ralph Phillips of San Diego Consolidated is handling details of exhibit placement, etc.

Location of the Pacific Coast Gas Association display is between the gas company exhibit and that of Barker Bros., Los Angeles home furnishers. The gas company and P.C.G.A. exhibits have been integrated in design, the P.C.G.A. being arranged as a patio setting to the gas company space, with an arch cut through connecting the two. The Barker Bros. exhibit will be a 1½-story Monterey-type house, in which some gas appliances will also be shown.

No equipment will be shown in the gas company exhibit except that of manufacturers who are represented in the Pacific Coast Gas Association display. To date the following have engaged space with the Association: American Stove Co., H. R. Basford Co., Day and Night Water Heater Co., Electrolux Refrigerator Sales, Inc., Gaffers & Sattler, Glenwood Range Co., Jas. Graham Mfg. Co., O'Keefe & Merritt Co., Pacific Gas Radiator Co., Payne Furnace and Supply Co., Geo. D. Roper Corp.

Arrangements for the P.C.G.A. exhibit are in charge of Clifford Johnstone, managing director of the Association. F. A. Lavigne will be in attendance at the booth for the Association.

Casa de Tempo

Of considerable interest from the standpoint of gas equipment is the "Casa de Tempo", a two-story Monterey-style home with foundation plan of 100-foot width and 63-foot depth. This home is sponsored by 10 underwriting firms, one of which is the Natural Gas Bureau representing the Los Angeles Gas and Electric Corp., Southern California Gas Co., and Southern Counties Gas Co. In all, 58 firms manufacturing building materials and home supplies will be represented in the home furnishings.

Casa de Tempo is an all gas service house, with range, refrigerator, water heater, central and auxiliary heat, all supplied by the modern fuel.

Arrangements for the Gas Bureau in connection with the Casa de Tempo have been in charge of Clyde H. Potter, Southern Counties Gas Co.

While built in substantial fashion on a frame-work of 2-inch by 8-inch redwood underpinning, with concrete foundation, the home is designed so that it can be cut into three sections for moving. Following the exposition it will be given away free, as furnished, to the holder of a lucky ticket.

As an example of modern gas residential heating Casa de Tempo is outstanding. Its walls of stucco and steel mesh are fully insulated on both sides. The roof is of heavy slate-colored multiple-shingle fireproof construction.

The heating system consists of a No. 135, Payne forced air unit located on and serving the first floor, together with a No. 90 F.A.U. located on and serving the second floor. The duct system for the first floor is carried under the floor while that serving the second floor is carried in the attic.

Supply grilles are located in the walls 7 feet above the floor, and are of the diffusing type. Cold air return grilles are located in living room, reception hall and dining room, both furnaces taking the return air from a common plenum chamber located on the first floor.

Controls are thermostatic with additional switches which control the blower for ventilation only.

Casa de Tempo consists of living room, dining room, hall, powder room, kitchen, breakfast room, maid's room and bath on the first floor, with three bedrooms, boudoir, three baths and two lavatories on the second floor, all heated.

Seven or eight attendants will be on hand in the home constantly, including some representation for gas.

A 32-page fully illustrated booklet is being prepared on Casa de Tempo, four pages of which will be devoted to gas kitchen planning and gas service. The booklet is being prepared for the California Exposition Home Co., representing the incorporation of home underwriters, by J. S. Spaulding of the Los Angeles Gas and Electric Corp.

Nearly 2 miles of gas mains have been laid in the Exposition grounds by San Diego Consolidated. Gas will be used for cooking by all of the restaurants, including the "Cafe of the World" which will seat 900 diners. Other special gas exhibits include that of the Venetian glass blowers, where gas will supply a glass melting furnace; a gas-fired boiler in the Ford Exhibit will demonstrate manufacture of paint from soya beans, and another boiler in the Coco Cola bottling plant display will also be fired by gas.

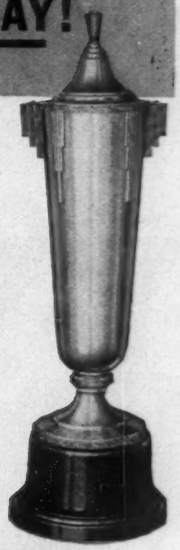
"Gas Appliance Day" has been set by the Exposition management for September 21. It is planned that gas men attending the P.C.G.A. convention at Pasadena, closing on September 20, may see the Fair in a body.

While the Exposition is dated nominally from May 29 to November 11 there is likelihood it may continue four or five additional months.

L. F. Ryall Made Sales Manager of General Gas Light Company

The General Gas Light Co., Kalamazoo, Mich., announces the appointment of L. F. Ryall as sales manager, in which capacity he will supervise sales of the company's entire line of appliances. Mr. Ryall was formerly vice-president in charge of industrial sales for the company.

140 CHECKS FOR APRIL! 140 CHECKS FOR MAY!



140 *more* CHECKS ARE WAITING FOR *June* WINNERS

IN THE "PROSPERITY CUP CONTEST" *FOR* REFRIGERATOR SALES!

J. W. WEST, JR.,
Secretary,
American Gas Association

AND DON'T FORGET . . . 63 Grand Awards are still to be made! Awards of $100, $90, $80, $70, $60, $50, $40, $30 and $20 in each division. BE SURE THAT YOUR COMPANY'S REPORTS ARE IN ON TIME! If you need additional blanks, write or wire to J. W. West, 420 Lexington Avenue, New York City.

REFRIGERATION COMMITTEE, AMERICAN GAS ASSOCIATION

Gas Industry's Depression Record in California

FROM the Pacific Coast Gas Association headquarters comes the following table which summarizes vital statistics of gas companies operating in California for the six-year period 1929-1934. It will be noted that active meters and total sales in cubic feet are at an all-time high. Revenue for 1934 is less than in any year except 1932, reflecting falling rates and less gas used for heating because of two successive warm winters.

	1929	1930	1931	1932	1933	1934
Active Meters—Dec. 31	1,325,912	1,362,246	1,383,315	1,368,807	1,366,175	1,429,794
Sales M c.f.	125,837,544	122,524,661	139,774,542	116,229,722	128,126,121	145,880,468
Gross Revenue	$67,127,869	$64,171,252	$64,802,688	$63,777,112	$65,554,346	$64,132,650
Miles Main—Dec. 31	17,717	18,925	20,066	20,675	20,956	21,051
Employees—Dec. 31	9,987	9,150	9,447	9,568	9,218	8,912

Sales Department Changes Effective in New Orleans

NEW ORLEANS Public Service Inc. has instituted a number of changes in the organization of its sales department, which comes under the direction of H. E. Meade, general sales manager of the company. Work of the department is now organized under three major divisions, the dealer sales division, the residential sales division, and the commercial and industrial sales division.

E. N. Avegno is manager of the dealer sales division, which has been newly created. Three dealer contact representatives have been added, making a staff of four in this department, all working on commercial and industrial as well as residential sales contacts which involve dealers. Mr. Avegno was formerly manager of the company's residential sales department.

S. L. Drumm, formerly assistant manager of the residential sales department, is now manager of the new residential sales division. W. J. Amoss heads the commercial and industrial sales division.

Before the new set-up became effective, early in May, the work was organized under two separate departments, one for residential and one for industrial and commercial sales, each with a separate clerical force. The sales department's clerical force is now consolidated into one group, serving the three new divisions.

Utah Gas Utilities In $20,000,000 Merger

THE Utah Gas and Coke Co., Wasatch Gas Co., and the Ogden Gas Co. have merged to form the Mountain Fuel Supply Co., with a $20,000,000 capitalization. Stockholders of the companies approved the merger on May 6.

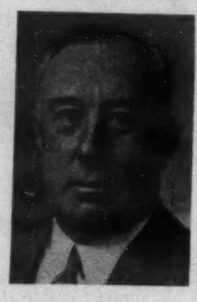
Admittance of the Western Public Service Corp., the old Mountain Fuel Supply Co., the Uintah Pipe Line Co., and the Aspen Mountain Gas Co. into the merger was also approved. Completion of the consolidation with these companies depends upon approval of stockholders of the four latter companies.

The capitalization of the new corporation will be divided into 2 million shares of capital stock of $10 par value. Outstanding common stock of the Utah Gas and Coke Co. will be cancelled and preferred stock converted into preferred stock of the consolidated corporation. Cancellation and conversion of shares of issued and outstanding stock of the other utilities merged with the new corporation also will be necessary.

Bailey Ass't Manager at Philadelphia for American Meter

American Meter Co., New York, N. Y., has announced the appointment of M. N. Bailey as assistant manager of its factory and sales office in Philadelphia, Pa.

Mr. Bailey was born in Cape May, N. J., and received his education at the Cape May High School and Deats Academy. He joined the Keystone Meter Co. in 1909 as a salesman after 12 years in the plant and instruction department of the Bell Telephone Co. of Pennsylvania. In 1915 he became associated with the John J. Griffin Co. and has been sales representative for that factory and subsequently for American Meter Co. as a whole.



Mr. Bailey is a member of the A.G.A., Pennsylvania Gas Association, Southern Gas Association, New Jersey Gas Association and Maryland Utilities Association. He has served on various committees for these associations from time to time, and is at present a member of Council of the Pennsylvania Gas Association and chairman of the Entertainment Committee.

New Business Department Changes for L. A. Gas and Electric

LOS ANGELES Gas and Electric Corp., looking toward a more aggressive sales program, has recently instituted a number of changes in its new business department. The name of the department has been changed to sales and advertising department to more clearly define the activities covered.

The new setup brings a more definite division of the department's activities. Under it the gas sales work falls into two main branches, Domestic Gas Sales, and, Commercial and Industrial Gas Sales. Under the Domestic Gas Sales Division are the following activities: Appliance displays, builders' service, home service, and dealer representative. The Commercial and Industrial Gas Sales Division comprises industrial engineers, hotel and restaurant representative, steam heating and water heating, and utilization development.

It is expected that the chief expansion of the department's activities will come in domestic sales work, principally in the direction of more extensive dealer aids, since the corporation does not merchandise appliances directly.

Sales Organization Added by Houston Pipe Line Co.

Houston Pipe Line Co. is now operating a sales organization headed by Robert L. Dabney, industrial engineer who has been with the company for the past two years and has a background of experience in engineering and sales work. Direct promotion of gas sales to larger consumers such as refineries, cement plants, and for drilling in the Gulf Coast area is the function of the new department, according to C. Lee Wood, general manager of the company.

So. Calif. Gas Co. May Tie Into Semi Tropic Field

Southern California Gas Co. has under contemplation extending its facilities into the Semi Tropic dry gas district located in Kern County, San Joaquin Valley. The original discovery well in this area is now delivering 10,000,000 cubic feet daily into the Pacific Gas and Electric Co.'s 16-in. Buttonwillow-Kettleman transmission line, and Standard Oil Co. which discovered the field has several additional wells drilling. The discovery well came in on March 9.

About 15 miles of large size line would be required to tie the field into Southern California Gas Co.'s transmission system near the Belridge field.

Lone Star Gas Corp. Juarez (Mex.) Gas Co. Property Sold

Texas Cities Gas Co., subsidiary of the Lone Star Gas Corp., has sold its Juarez (Mex.) Gas Co. property to Jesus R. Silva of Juarez, who will operate the plant under its present name, obtaining supply from the Texas Cities Gas Co. The Juarez company is the only foreign gas distributing property in the Lone Star Gas Corp. group and the company preferred to confine its operations to the United States. The plant was a part of the El Paso system when Texas Cities Gas Co. took over the El Paso plant.

Austin, Minn., Votes Bond Issue To Finance Municipal System

Austin, Minn., on May 6 voted a $115,000 bond issue for the construction of a municipally owned natural gas system. In April the Water and Light Board of Austin placed $60,000 in the city's general fund for use toward financing the municipal project. The bond issue passed on May 6 will provide the remainder of the $175,000 estimated cost of construction.

Seeley Given Engineer Rating

M. A. Seeley, formerly assistant engineer in the Los Angeles Gas and Electric Corp.'s valuation department, has been given the rating of engineer and has been transferred to the corporation's executive offices.

The WISE CHOICE!

- - - for service lines

What kind of performance will it give when installed and how long will it last, are the two main points Gas Companies naturally consider when selecting pipe for service lines. To give the ultimate in service, pipe must be clean and smooth, inside and outside; that is, it must be free from mill-scale. Such scale clogs orifices, causes corrosion and generally contributes to deterioration in the line. Therefore, Gas Companies will be wise in choosing NATIONAL Scale Free Pipe. It is made by a special Scale Free Process, applied to butt-weld sizes ½ to 3-inch. Here are the outstanding advantages of this clean, smooth pipe—

Minimized corrosion, particularly pitting—Clean, smooth surfaces, inside and outside—Full delivery capacity, less friction loss—No damage to valve seats; no clogging of small orifices—Greater strength at the weld.

When you order standard pipe for service lines, specify NATIONAL Scale Free and be sure of the maximum in performance and economy. Large use by discriminating buyers, continued through many years, has made it—*America's Standard Wrought Pipe.*

CHROMATE TREATMENT—*All National Galvanized Pipe is given a special chromate treatment to resist discoloration and the formation of white rust. This patented process preserves that smooth, glistening surface or metallic lustre which is characteristic of good galvanizing.*

NATIONAL TUBE COMPANY · Pittsburgh, Pa.

Pacific Coast Distributors—COLUMBIA STEEL CO., San Francisco, Calif.

Export Distributors—UNITED STATES STEEL PRODUCTS CO., New York. N. Y.

United States Steel Corporation Subsidiary

NATIONAL SCALE FREE PIPE
SPELLERIZED

Superiority of Gas for Domestic Cooking Clearly Shown in A. G. A. Laboratory Tests

THE industry has been waiting expectantly for the publication of results of the American Gas Association Testing Laboratory's comparison of gas and electricity for domestic cooking. This information is now available, under date of April 15, as Bulletin No. 6, entitled "Investigation of Domestic Cooking by Gas and by Electricity". This bulletin can be obtained from the A.G.A. Headquarters at a price of $2.00 per single copy, $0.50 per copy for the next 24 copies, and $0.375 for the balance of 100 copies, after which a special price will be made.

The bulletin contains facts, figures, tables, graphs and illustrations on every phase of gas and electric range costs, operation and performance, so written as to be understood by technicians and laymen alike. Rate data and cost comparisons have been included, applicable to every locality, and comparative operating data for any city can be readily computed. The subjects covered are initial and installation costs, operating costs, maintenance costs, speed of operation, quality of cooked products, convenience, air vitiation and cleanliness, and performance standards and characteristics.

Some of the results and conclusions are as follows:

The retail and installation costs of electric ranges are considerably higher than those of gas ranges having comparable design and constructional features. Average values indicate that this differential amounts to between $80 and $90.

Gas ranges require an average heat input 2.077 times greater than electric ranges to prepare, during one week, identical meals for a family of four.

The weighted average incremental electric rate applicable to cooking for the 100 largest cities in the United States is 3.35 cents per kilowatt hour. The weighted average manufactured gas rate for the same cities for an average monthly consumption of 1,665 cubic feet is $1.175 per thousand; for mixed and natural gases, assuming average monthly consumption of 2,000 cubic feet, the weighted average rates are $1.244 and $0.935 respectively.

Using the average rates indicated above and the energy ratio of 2.077, the average cost to a consumer for operating an electric range would be 2.14, 3.19 and 5.44 times greater than for a gas range when manufactured, mixed and natural gases, respectively, are used.

Such factors as size and type of utensils, regulation of heat inputs, and effective utilization of stored heat in surface units will, if not subject to close supervision, materially add to electric range costs but will have little effect on gas ranges.

Special units commonly furnished on electric ranges, to effect economy of operation, are extremely slow, so that gas ranges will cook 1.75 times faster in comparison.

The total time to perform, successively, all cooking operations during preparation of a one-week menu for a family of four was 1.097 times greater in the case of electric ranges, and 1.172 times greater to prepare a second week's menu. The latter menu was typical of families of limited income.

The average loss of weight in oven-cooked meats was found to be 21.43 and 19.54 per cent of the original weight for electric and gas ranges respectively.

Gas range ovens yielded more evenly baked products, and in many respects the palatability of gas-cooked foods was greater than that of electrically cooked foods.

Gas ranges were found to be more convenient to utilize because more flexible regulation of energy input was possible; it was not necessary to interrupt heat input prior to end of cooking operation to avoid waste of energy, and not more than ordinary care was needed in the selection of the size and shape of utensil.

The average top element thermal efficiencies for gas and electric ranges were found to be 43.78 and 76.75 per cent respectively; after 446 hours operation the electric range top elements had decreased in efficiency 6.78 per cent.

The Big Name in
HEATING
and AIR
CONDITIONING
is
MUELLER-MILWAUKEE

W. T. Barbour

John A. Fry

J. A. Fry and W. T. Barbour in New Detroit-Michigan Appointments

THE board of directors of the Detroit-Michigan Stove Co. announces the election of William T. Barbour as chairman of the board, and John A. Fry as president of the company.

Mr. Barbour has been connected with the Detroit-Michigan Stove Co. for 40 years, starting as purchasing agent and moving on through the offices of vice-president to the presidency, and chairmanship of the board. He will continue to take active part in the affairs of the company.

Mr. Fry has been with the Detroit-Michigan Stove Co. for the past 30 years, beginning as a timekeeper and later becoming paymaster. He was appointed general superintendent and a few years later was promoted to secretary. He later became vice-president, still retaining his position as secretary, and served in these two capacities until his elevation to the presidency.

Mr. Fry has had a prominent part in American Gas Association enterprises, and at present is serving as chairman of the Manufacturers' Section. He is also general chairman of the Gas Appliance Institute, and is associated with many other groups directly or indirectly connected with the gas industry.

Annual Gas Range Week Closes in Northern California

Annual Gas Range Week, sponsored by the Gas Appliance Society of California, closed May 4 with early returns reporting the event highly successful. The campaign began April 27 and was conducted throughout the entire Pacific Gas and Electric Co. territory. A $16 oven heat regulator was offered to all purchasers of kitchen heater type ranges selling usually for more than $125, and on ordinary ranges selling regularly for more than $96, with manufacturer and dealer bearing equally the cost of the premium. Newspaper advertising, radio announcements and window cards were used in promotion of the campaign.

United Adds Elizabeth, La.

United Gas System is adding the town of Elizabeth, La., located near Oakdale in the southwestern part of the state, to its service, a 10-mile extension of 6-inch welded pipe being constructed to the community. Paper mills of the Calcasieu Sulphate Paper Co. will provide a major industrial load at Elizabeth.

BEND YOUR SUMMER SALES CURVE UP

To make sure you do so
We Introduce the New

DETROIT JEWEL
and
GARLAND

Summer Promotional Number

This new Detroit Jewel and Garland Summer Promotional Number, combining beauty, style and utility at a low price . . . YOU CAN SELL THIS RANGE FOR $59.50 . . . is the best value we have ever offered to our trade in many years. In design, this number conforms to the smartest trend of the moment. The colors harmonize with present-day kitchen decorations.

Here is a number that will capture the market wherever shown, and take the dip out of your summer sales curve. Do not let this opportunity for the biggest summer volume in years slip by.

In White!
Detroit Jewel No. 6551CX
Garland No. 3551CX

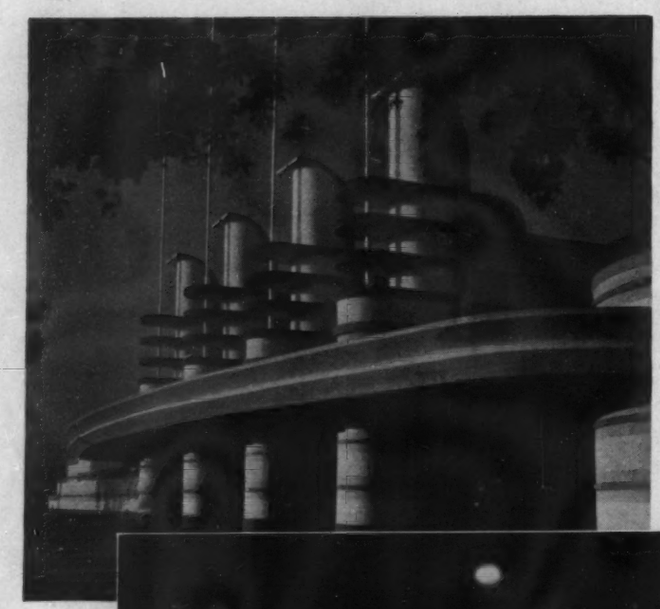
In Ivory and Tan
Detroit Jewel No. 6550CX
Garland No. 3440CX

In Ivory and Green
Detroit Jewel No. 6552CX
Garland No. 3552CX

Note the spacious service drawer with special shelf compartment above. Oven is 16 inches wide, 20 inches deep; made in one piece with rounded corners. The sanitary oven tray is removable and can be cleaned as easily as a china plate. Oven door is counterbalanced and heavily insulated. Top grates and burners are porcelain finish. Burner pan is black to match burners and is also finished in porcelain. Everything to make this range complete and modern in every detail has been included.

Write, wire or phone for samples

DETROIT-MICHIGAN STOVE CO.
Detroit, Michigan



▲

AT LEFT:

Entrance to new exhibit center in Los Angeles where Housing Exposition is under way.

BELOW:

Gas Industry Exhibit, island booth sponsored by cooperating gas companies and manufacturers.

▼

Gas Industry Exhibit Is Outstanding Display of Federal Housing Exposition in Los Angeles

GAS is literally "stealing the show" at the most spectacular Federal Housing Exposition held to date. Located in Los Angeles on Beverly Boulevard near Fairfax, a 2½-acre permanent exposition building has been constructed in which the Housing Exposition opened on May 18 to run until June 9.

Located just inside the main entrance is the Gas Industry Exhibit, a prominent "island" display staged by the three Los Angeles gas companies and 18 cooperating manufacturers. As the photograph above indicates, the exhibit is superbly styled and in all of its appointments tends to designate gas service as completely modern.

At the center of the display stands a tower surmounted by a blue Neon flame identifying the Gas Industry Exhibit. On either side of this tower are mural paintings, one showing a cave-man-and-wife scene with the first flame, symbolizing man's first utility.

As an attention getter at the head of the display "Miss 1935—the Writing Robot" is in constant attendance, writing on a large poster the story of the various products in the gas exhibit. This robot, a German invention, is being used for the first time on the West Coast.

The water heater section of the exhibit shows five lines of water heaters, and includes cutaway models and new Everdur tanks.

Another feature is the lounge room in which are located a model all-gas kitchen and a display panel board showing time and temperature control thermometers.

A general appliance display section shows modern heating and air-conditioning equipment, together with clock-controlled ranges in various colors.

In all, the exhibit covers 4,140 square feet. Special flooring painted a blue-green slate color contrasts effectively with the canary yellow background of the display walls. Wall trimmings are in silver and gold. Around the sides of the exhibit stands a row of silver-colored coconut palms.

Chief credit for the production of the Gas Industry Exhibit goes to J. E. Kern of the Southern California Gas Co., who acted as chairman of the Natural Gas Bureau committee in charge, and who personally took charge of design, construction, and exhibit arrangements. V. S. Klein, who designed many exhibit structures at both the Chicago and San Diego expositions, was retained by the Bureau to assist in design and to supervise construction. Completing the committee under Mr. Kern's chairmanship were Clyde H. Potter, Southern Counties Gas Co., and Frank Moon, Los Angeles Gas and Electric Corp.

Personnel from the three companies, trained in a special school held three consecutive days prior to the exhibit opening, are manning the Gas Industry Exhibit. Representatives of manufacturers whose products are displayed were given opportunity at the training school to inform the attendants on features of their respective appliances.

Total outlay on the Gas Industry Exhibit, including space charges, design, construction and other expenses, came to $12,500.

Across the aisle from the Gas Industry Exhibit were located five additional booths taken by individual gas equipment manufacturers.

Gas appliances are well represented in several other points at the Exposition, including the Honeymoon Cottage, the Glass House, Little Theatre of the Stars, major department store spaces, and the Los Angeles Times Model Home. In addition to a modern gas range this latter home is equipped with one of the Payne forced air units for heating.

Trailers Added to New Orleans Sales Department Equipment

Three automotive trailers are being added to the sales department equipment of New Orleans Public Service Inc., according to S. L. Drumm, manager of the company's residential sales division. The trailers will be used for neighborhood demonstration of major appliances.

The new trailers are of attractive streamline design, and are arranged to hook behind regular salesmen's cars. Two senior salesmen will accompany each trailer. Each trailer will serve a group of 12 territory salesmen, and will be rotated throughout the various sales territories on regular routing.

According to Mr. Drumm the company has found home demonstration work very effective on small equipment, and the new trailers provide the means for demonstrating large equipment at the customer's door.

No Senate Investigation of Natural Gas Industry

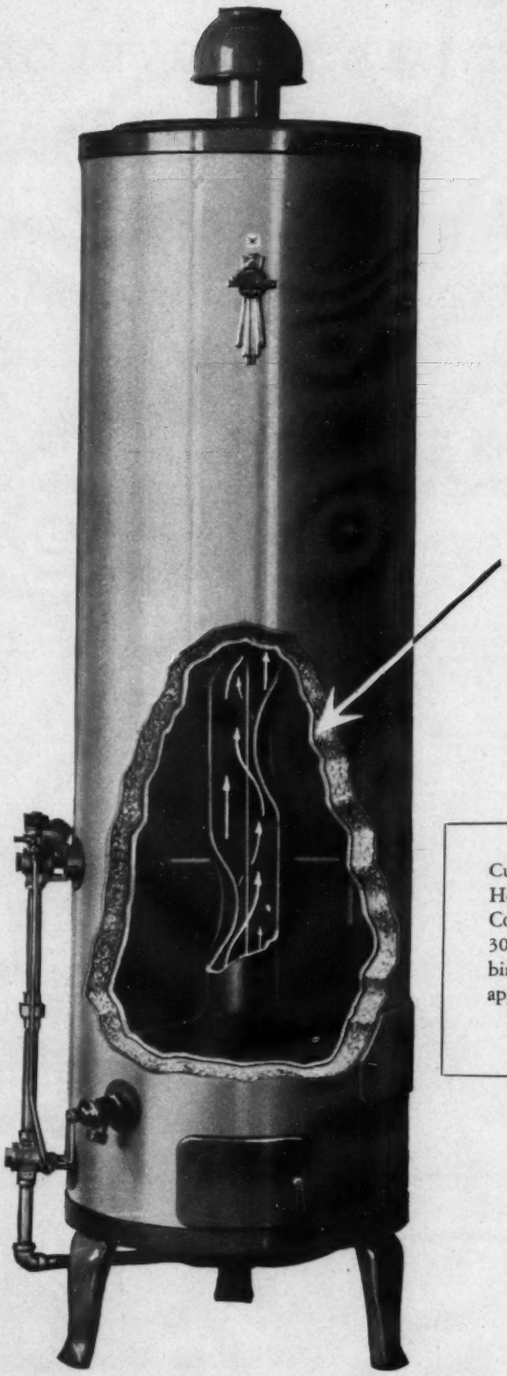
Senate Resolution 108, submitted by Senator Couzens, and proposing that the U. S. Senate Committee on Interstate Commerce should conduct an investigation of the natural gas and natural gas pipe line industry, has been withdrawn at the sponsor's request. The reason assigned is that present and proposed investigations by the Federal Trade Commission are designed to cover the same field as that contemplated in the Couzens resolution, and similar proceedings by the Senate committee would involve unnecessary duplication.

M. C. Brown Made Vice-President

M. C. Brown, well known in the California gas and oil industry, has been made vice-president of Hillman Kelley, Inc., Los Angeles equipment supply firm. Mr. Brown for the past 17 years has represented the Jones & Laughlin Steel Corp. of Pittsburgh, Pa. Hillman Kelley, Inc., for a number of years has acted as distributor for the Jones & Laughlin Steel Corp. products.

When the tank is *rustless* EVERDUR

you can promise your customers *clean hot water indefinitely*



Your customers want more than hot water. They want clean, *rust-free* hot water... not for just a few years, but indefinitely. Their best assurance of trouble-free service is a tank which will not rust.

Recommend one of rust-proof Everdur! For Everdur Metal is copper... scientifically alloyed to provide the strength and welding properties of steel. And it cannot rust!

Everdur Tanks can be recommended without any qualification whatsoever! All-welded Everdur Tanks have been subjected to pulsating pressure from 0 to 150 pounds, 13 times a minute, and have withstood the test without signs of leaks or distortion for more than 1,000 hours... the estimated equivalent of 40 years of normal service.

No wonder leading makers of range boilers and automatic heaters now standardize on Everdur for all rust-proof tanks. Additional data and names of manufacturers using Everdur, mailed on request.

Cutaway view of BAILEY Automatic Gas Water Heater, made by Day and Night Water Heater Co., Ltd., Monrovia, California. Offered in 20, 30, 40 and 50 gallon sizes. Bailey heaters combine several special features, are all A. G. A. approved, and are all offered with tanks of durable, *rustless* EVERDUR.

EVERDUR METAL

"Everdur" is a registered trade-mark identifying products of The American Brass Company made from alloys of copper, silicon and other elements.

ANACONDA
from mine to consumer

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities

EVERDUR METAL *for* TANKS

The Only Handbook of Butane-Propane Gases

Big 2nd Edition

NOW READY — DETAILING THE REVOLUTIONARY DEVELOPMENTS OF THE PAST TWO YEARS!

This Table of Authoritative Contents Speaks for Itself!

SUMMARY OF DEVELOPMENTS: Brief review of progress during past two years since publication of first edition, including foreign expansion, new industrial uses, new manufacturing sources, new plant and equipment design, etc.

USE IN INTERNAL COMBUSTION ENGINES: A comprehensive discussion of liquefied petroleum gases in this important new use including engine design, comparison of propane and butane with other fuels, use in stationary engines, block testing automotive engines; use in rail cars, trains and locomotives; use in automotive engines; refrigerator cars and trucks; dirigibles and aeroplanes; utilization equipment such as carburetors and mixers, vaporizers, fuel tanks, valves and fittings, etc.; consideration of safety in relation to internal combustion engine use of these gases.

DESIGN AND INSTALLATION OF STORAGE: A fundamental chapter devoted to safe design of storage tanks. Application of the recently adopted A.P.I.-A.S.M.E. Code is thoroughly covered, and reference made to other pertinent regulations, including those of the National Fire Protection Association, the Industrial Accident Commission of California, and others. Discussion of special design problems is included, treating such phases as design of heads, reinforcement of openings, design of skid tanks, emergency relief provisions. Concluding the chapter is a valuable reminder list of essential precautions to observe in ordering storage tanks.

SUPPLY FROM PETROLEUM REFINERIES: Characteristics of refinery gases with reference to liquefied gas production. Detailed discussion of oil absorption and compression processes for liquefied gas recovery; fractionating columns; extraction of ethane from refinery vapor.

ENGINEERING DATA ON THE LOWER OLEFINS: A basic reference chapter consisting of tables on properties of liquefied petroleum gases produced from petroleum refineries—a companion chapter to that in the original Handbook on properties of the natural-gas-produced liquefied petroleum gases.

DOMESTIC APPLIANCE TESTING AND UTILIZATION: Separate discussions of undiluted and carbureted gases from the standpoint of their burning characteristics. Appliance testing procedure on liquefied petroleum gases, with special reference to American Gas Association methods. Fundamentals of appliance design for proper use of these gases. Latest A. G. A. Laboratory Approval requirements. Standards of construction and performance for gas appliance accessories.

ECONOMIC COMPARISONS WITH COAL, OIL, ELECTRICITY, PRODUCER GAS, MANUFACTURED GAS: Introductory section on requirements of a good fuel, available heat of gases, a list of applications for liquefied petroleum gases, relative advantages of propane and butane. A number of ready-reference charts show cost comparisons with other fuels as well as with electricity. Domestic, commercial and industrial comparisons are made in connection with each competitive fuel, and numerous tables present competing fuel cost data for special uses.

TOWN PLANTS: A new chapter combining discussion of butane-air and undiluted types of plants. Written from a practical operating standpoint and giving summarizing comment on a survey which covered every town plant now in operation. New types of plant equipment, and discussion of over-all plant design. Introductory section treats such pre-construction considerations as estimating market, sendout peak loads; plant location, plant structures. Major subject heads are: liquid storage, vaporization, undiluted plants air-mix plants (including description of various types of mixers), gas storage, distribution (system design, odorization, dehydration, conversion, etc.). The operating experience summary which concludes the chapter covers plant and distribution problems, consumer complaints, liquid cost, rates, classification of sales, collection experience, and minimum number of customers required to maintain a central plant property. Flow diagrams and many illustrations.

MANUFACTURE FROM NATURAL GAS: A new chapter dealing with the natural gasoline plant process, with special reference to operations involved in liquefied gas recovery. Flow diagrams assist in presentation of plant processes.

SPECIAL USES: Orchard heating, construction camp use, and various special applications such as cutting and welding.

VOLUME CORRECTION FACTORS: A series of original tables for temperature-volume corrections, ranging from 100° to 149° A.P.I. gravity, and from 20° to 119° F. Tables read both in degrees A.P.I. and specific gravity at 60° F. Also tables for converting specific gravity to degrees A.P.I., and vice versa. Preliminary discussion explains use of tables.

SUPPLEMENTS AND REVISIONS

A number of chapters in the first edition have been retained for the second edition, with additions and modifications made by their original authors to bring them in line with present knowledge. Late information is found in the Handbook on:

TRANSPORTATION: New material on motor truck and trailer design, describing typical equipment in use, pumps for loading and unloading, etc., current railway freight rates; requirements for shipping by water, etc.

USE WITH OTHER GASES: An added section on standby gas, also further discussion of reforming, use of propane for underfiring coke ovens, and use of butane or propane with coal gas under peak load conditions.

ANALYSIS AND TESTING: Specifications for commercial grades, test procedure for determination of specific gravity, water content, vapor pressure, etc. Detailed outline of analytical procedures for various gases and with various apparatus. The above and other additions have been made to the chapter on Composition and Analytical Determination.

PROPERTIES OF MIXTURES: Additional curves are included, among them those on dew points of butane, propane, and typical mixtures, carbureted with air; curves showing relation between B.t.u. and specific gravity.

BOTTLED GAS DISTRIBUTION: This chapter has been brought up to date, with sections on foreign sale of bottled gas, present trends in bottled gas merchandising, new types of service equipment being developed, design of propane bulk plants.

BIBLIOGRAPHY: This valuable feature of the first edition has been extended to list worthwhile material published during the past two years.

CENTRAL PLANT DIRECTORY: A new directory listing all town plants as well as semi-permanent plants on large construction projects; gives information secured directly from the companies on plant location, number of meters, type of service, plant capacity, rates, etc.

CATALOGUE SECTION: Current detailed engineering information on the many products now manufactured for service on butane and propane.

BUYERS' GUIDE: Revised commodity listings of firms supplying equipment, appliances, services for the liquefied petroleum gas industry.

HERE'S A HANDY COUPON

WESTERN GAS,
810 South Spring St., Los Angeles, Calif.

Send me the Handbook of Butane-Propane Gases (**Second Edition**), for 10 days' examination subject to approval or return. Within 10 days of receipt I will send $5.00, plus a few cents for postage and delivery, or return the book postpaid. (We pay postage on orders accompanied by remittance.)

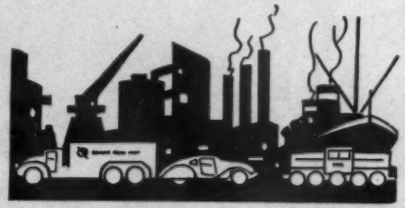
Name.....Position.....

Company.....

Address.....City and State.....

Check for $.....enclosed. Date.....

(Books sent on approval in U. S. and Canada only.)



SEND FOR IT TODAY!

BUTANE-PROPANE NEWS

Best Gain Since 1931 Seen in 1934 Statistics

FROM the petroleum economics division of the United States Bureau of Mines, Department of the Interior, there was released on May 24 the following statistical report on marketed production of liquefied petroleum gases in 1934. According to the Bureau's figures marketed production totaled 48,173,000 gallons in 1934, a gain of 23.7 per cent over the 38,931,000 gallons reported for 1933. This represents an increase of 9,242,000 gallons for 1934 over 1933, the largest gain in demand for any year excepting 1931. Table No. 1 illustrates the rapid expansion in the marketed production of liquefied petroleum gases during the period 1928-1934.

Propane, butane, pentane and propane-butane mixtures are the liquefied petroleum gases covered in this annual survey. The gain in demand for butane was again outstanding, the total for 1934 increasing to 25,553,000 gallons or 34.1 per cent over 1933. The market for propane in 1934 was 18,681,000 gallons compared witht 15,835,000 gallons in 1933. Deliveries of pentane and propane-butane mixtures were slightly less in 1934, totaling 3,939,000 gallons compared with 4,040,000 gallons in 1933. Sales of pentane considered separately were of minor importance, totaling only 832,000 gallons in 1934 and 814,000 gallons in 1933.

A study of the various demands for the several gases covered in this survey shows that the industrial requirements for butane increased from 12,180,000 gallons in 1933 to 19,443,000 gallons in 1934, while the quantity used for gas manufacturing purposes declined from 6,170,000 gallons in 1933 to 5,064,000 gallons in 1934. The domestic demand for butane in 1934 was 1,046,000 gallons compared with 706,000 gallons in 1933. About 900,000 gallons more of propane were consumed for domestic purposes in 1934 than in 1933; however, a more significant gain in the consumption of this gas was made in the industrial field, the demand increasing from 1,300,000 gallons in 1933 to 3,119,000 gallons in 1934. Deliveries of propane for gas manufacturing in 1934 were 326,000 gallons compared with 200,000 gallons in 1933. Pentane and propane-butane mixtures used by gas manufacturing plants in 1934 declined to 900,000 gallons from 1,948,000 gallons in 1933. Sales for domestic purposes were also less in 1934, but pentane and propane-butane mixtures delivered for industrial purposes increased from 507,000 gallons in 1933 to 1,640,000 in 1934.

TABLE NO. 1. MARKETED PRODUCTION OF LIQUEFIED PETROLEUM GASES, 1928-1934

Year	Total Marketed Production in Thousands of Gallons	Increase over Previous Year	
		Thousands of Gallons	Per Cent
1928	4,523	3,432	314.6
1929	9,931	5,408	119.6
1930	18,017	8,086	81.4
1931	28,770	10,753	59.7
1932	34,115	5,345	18.6
1933	38,931	4,816	14.1
1934	48,173	9,242	23.7

TABLE NO. 2. MARKETED PRODUCTION OF LIQUEFIED PETROLEUM GASES BY USES AND METHODS OF TRANSPORTATION—1933 AND 1934

(Thousands of gallons)

	Propane	Butane	Pentane and Propane-Butane Mixtures	Total 1934	Per Cent 1934	Total 1933	Per Cent 1933
By Uses:							
Domestic	15,236	1,046	1,399	17,681	36.7	16,626	42.7
Gas manufacturing	326	5,064	900	6,290	13.1	8,318	21.4
Industrial and miscellaneous	3,119	19,443	1,640	24,202	50.2	13,987	35.9
Total 1934	18,681	25,553	3,939	48,173	100.0	38,931	100.0
Per Cent 1934	38.8	53.0	8.2	100.0	.....	100.0	.....
By Methods of Transportation:							
Cylinders or drums	14,001	140	1,238	15,379	31.9	14,416	37.0
Tank cars, tank wagons, or by pipe line	4,680	25,413	2,701	32,794	68.1	24,515	63.0
Total	18,681	25,553	3,939	48,173	100.0	38,931	100.0

Propane is used largely for domestic purposes in households beyond the reach of gas company mains, but new uses are constantly being found for this gas by the manufacturing industries, particularly those requiring a close control of heat. Petroleum refiners use propane as a solvent in the manufacture of lubricating oils and as a refrigerant in dewaxing. Butane, which is used principally for industrial purposes, also serves as an enriching agent in gas manufacture. Recent developments on the Pacific Coast indicate that propane-butane mixtures make a very satisfactory motor fuel for internal combustion engines. So far this use for automotive vehicles has been largely confined to heavy-duty trucks and buses, which run between fixed terminals, where supply points for these gases have been established.

The American Gas Association has cooperated with the Bureau of Mines in this review of liquefied petroleum gases in 1934 by furnishing the following information regarding their distribution:

"Liquefied petroleum gas continued to gain favor among the small communities throughout the country during 1934. Three new companies began operations bringing the total up to 72. These 72 companies supplied gas to approximately 30,000 customers in 171 communities in 28 states. Butane-air-gas with a heating value ranging from 520 to 600 B.t.u. per cu. ft. was supplied to 110 communities in 26 states by 59 companies. Undiluted butane and propane gas with a heating value of 2,800 to 3,000 B.t.u. per cu. ft. was supplied to 14 communities in California and Nevada by 6 companies. Seven companies in Maryland, Minnesota, New Jersey, North Dakota, Virginia and Wisconsin supplied 47 communities with undiluted propane gas with a heating value of 2,550 B.t.u. per cu. ft.

"Although no new communities in Canada were added during the year, persons living within a 30-mile radius of Calais, Maine, were given an opportunity to receive gas service by the formation of the Citizens Philgas Co. Milltown and St. Stephen, New Brunswick, continued to be supplied from Calais, Maine, while the plant at Three Rivers, Quebec, continued to supply that town."

Most of the material gain in demand for liquefied petroleum gases has been in the industrial field, where bulk shipments are the usual method of handling, consequently the quantity moving into consumption by tank car, tank truck and pipe lines increased to 32,794,000 gallons or 68.1 per cent of all shipments in 1934 compared with 24,515,000 gallons or 63.0 per cent of the total deliveries in 1933. Cylinder and drum shipments in 1934 were 15,379,000 gallons, which, although higher than the 1933 total, represented only 31.9 per cent of all shipments compared with 37.0 per cent in 1933.

This study of the marketed production of liquefied petroleum gases during 1934 has been made possible through the cooperation of 22 companies, 6 of which operate in the Pacific Coast area. Deliveries on the Pacific

Coast were 11,471,000 gallons, a gain of 70.8 per cent over 1933. This sharp rise in the demand in this area is largely the result of the increased use of these gases as fuel for internal combustion engines. Deliveries east of the Rockies were 36,702,000 gallons in 1934, a gain of 13.9 per cent over 1933.

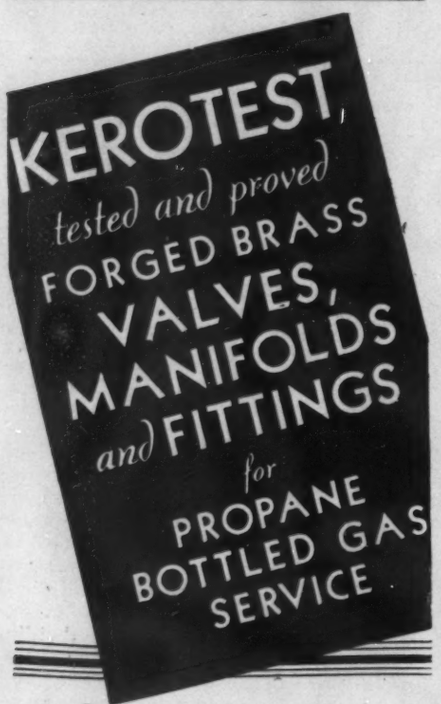
The report was compiled by A. T. Coumbe, Jr., associate economic analyst of the Petroleum Economics Division, of which G. R. Hopkins is acting chief economist.

"Gas Industry News Bulletin" Inaugurated by Philgas Dept.

A "Gas Industry News Bulletin" has been inaugurated by Philgas Department of Phillips Petroleum Co. for its customers using propane or butane in the manufacture of gas in butane-air, propane-air and undiluted propane plants; or as standby gas for peak load gas production or for the carburetion of water gas.

No regular dates are scheduled for publication of the bulletin, but it is expected to be issued at least once every three months. Its contents will cover new developments in the industry, plant operation, distribution, and appliance sales.

Volume 1, Number 1, among other features includes a sketch of a butane-air plant vaporizer assembly, a list of industrial and special uses of liquefied petroleum gases, information on leakage and dust problems in distribution systems, and a number of plant operation wrinkles.



Write for descriptive circular

KEROTEST MFG. CO.
PITTSBURGH, PA.

KEROTEST

Portland Gas and Coke Co. Offers "Household Set"

Portland (Ore.) Gas and Coke Co., has inaugurated an interesting merchandising plan in which it offers a complete "household set" consisting of gas range, gas refrigerator, automatic storage water heater and thermostatically-controlled gas conversion burner on payments as low as 25 cents a day.

The plan will be pushed by a comprehensive advertising campaign by the gas company in cooperation with local department stores, plumber and furniture dealers who have given the low part-payment plan an enthusiastic reception.

Two-year quotas for both company and dealer sales have been set to total 23,000 appliances, including 8,000 ranges, 6,000 water heaters, 5,000 house heating appliances and 4,000 Electrolux gas refrigerators.

Eighty-three household sets were sold from April 23, the date the plan was announced to May 14. During that period customers purchased 228 appliances. Total number of appliances purchased by all customers during the period was 1556, at a total cost of $146,-403.82.

Financing of the household sets will be handled through the Gasco Finance Co. on a basis of a maximum of 60 months with 6 per cent disappearing interest. No down payments are required on the purchases.

Through cooperation with the Federal Housing Administration, the Portland Gas and Coke Co. is also providing home owners who buy the four-appliance "household set" amounts up to $100 to be used in renovizing kitchens, or making other improvements incidental to the purchase. B. H. Parkinson is commercial manager for the company.

Dr. W. R. Hainsworth Elected Vice-President of Servel, Inc.

Dr. William R. Hainsworth, of Larchmont, N. Y., nationally known refrigeration science authority, has been made a vice-president in charge of engineering for Servel, Inc., manufacturers of Electrolux refrigerators at Evansville, Ind.

In 1933 Dr. Hainsworth received the Charles A. Munroe Award in recognition of his developments of the air-cooling principle in gas refrigeration. In January of this year he was elected a director of the American Society of Refrigerating Engineers.

Dr. Hainsworth is director of the Electrolux laboratories in Evansville, where the gas-operated and kerosene-operated refrigerators marketed by his company were developed under his supervision.

Robert Naylor Minot Manager

Robert Naylor has been appointed manager of the Minot (N. D.) Gas Co., to succeed O. W. Jawort who has moved to Helena. Mr. Naylor was formerly manager of the Northwest States Utilities Co. at Conrad, Mont.

Philgas Uses Radio Campaign

A radio campaign over 13 widely-scattered stations is being conducted by the Philgas Dept. of Phillips Petroleum Co. to introduce its new installation price of $9.75 to prospective bottled gas users in its various retail districts.

A. E. DeBurn Opens Butane Engineering-Contracting Service

A BUTANE engineering and contracting service has been opened by Arlan E. DeBurn, with address at 1201 Santa Fe Avenue, Los Angeles, Calif. Mr. DeBurn has been engaged in engineering sales work in Southern California for a number of years, as manager of engineering sales for Pacific Pipe and Supply Co., and as sales engineer for Southwest Welding & Manufacturing Co. of Alhambra. Until recently he was associated with the American Liquid Gas Corp., Los Angeles, specializing in liquefied petroleum gas products.

A. E. DeBurn

In his new activity Mr. DeBurn will handle a variety of engineering applications for liquefied petroleum gases, including internal combustion engine installations, and the general field of central plant, industrial, and domestic utilization problems.

Gas Floodlighting Used at New Klamath Falls Office

The Klamath Natural Gas Co. is utilizing a 3000-candlepower gas arc lamp to floodlight its new company headquarters at 700 Main St., Klamath Falls, Ore. Gas lighting is also used throughout the front offices and the display room where hotel-restaurant ranges, broilers and other heavy-duty equipment, in addition to domestic appliances, are on display. The company serves butane-air gas.

Two Utility Industry Bills Made Oklahoma Law

Governor Marland of Oklahoma has signed two bills presented during the last legislative sessions which are of interest to the utility industry. One of the bills authorizes cities to impose a 2 per cent gross receipts tax on utilities operating without a franchise, and the other permits municipal plants to extend gas lines beyond the city corporate limits.

Edgar Huffman in Charge Lone Star Caddo, Texas Station

Edgar Huffman, assistant chief engineer at the Lone Star Gas Co.'s Ranger, Texas, compressor station No. 3, has been promoted to the position of chief engineer of the Caddo, Texas, compressor station.

Butane Standby Plant at Joliet

The Western United Gas and Electric Co., Aurora, Ill., recently completed a 75,000-gallon capacity butane standby plant at Joliet (Lockport plant), where natural gas is being served.

C.G.M.A. to Hold Summer Meeting

A meeting of the Compressed Gas Manufacturers' Association, Inc., New York, N. Y., has been scheduled for June 13-15 at the Seaview Golf Club, Absecon, N. J.

Ruling on Taxability of Propane and Butane

A ruling issued by the Bureau of Internal Revenue on taxability of liquefied petroleum gases was released in April and provides as follows:

Where propane is advertised and sold for domestic and industrial purposes—and not for motor fuel purposes—it may be sold tax free without obtaining exemption certificates from individual purchasers.

Where butane is sold to consumers in cylinders for domestic heating and burning purposes, it may be sold tax-free without obtaining exemption certificates. However, where sold in bulk to consumers or dealers for use or resale for non-motor fuel purposes, butane may be sold tax-free only in cases where the seller obtains an exemption certificate from the purchaser prior to or at time of sale. This must certify that the product is purchased for use otherwise than as motor fuel, and otherwise than in the manufacture or production of such a fuel.

New Bulletins Issued by Philgas Dept.

Philgas Dept. of Phillips Petroleum Co. has issued five new bulletins: No. 50, "Propane Gas Service for the Textile Industry"; No. 51, "Industrial Propane in the Food Industry"; No. 52, "Industrial Propane Gas for Porcelain Annealing"; "Propane Gas Service for Small Cities"; and "Propane for Refining Lubricating Oils."

Interested persons may obtain copies by writing to the Philgas Dept. of Phillips Petroleum Co., 7-101 General Motors Bldg., Detroit, Mich.

Crushing Cylinders Before Junking Recommended by C.G.M.A.

In its recent Test and Specification Committee Report, the Compressed Gas Manufacturers' Association, Inc., of New York, ruled that the most desirable means of destroying cylinders that have failed to retest to specifications is to crush them before disposing of them as steel junk. Where this is impracticable the Committee recommended that a sufficiently large hole be cut from the cylinder to completely remove all markings stamped into the metal.

Kan. Power & Light Co. Appoints New District Managers

George Largent, formerly in charge of the Clyde, Kan., office of the Kansas Power & Light Co., has been promoted to manager of the Belleville, Kan. district of the company. Towns under his supervision are Belleville, Scandia, Narka, Mahaska, Cuba and Munden. A. L. Wilson has been appointed to succeed Mr. Largent at Clyde.

L. E. Myrick Supervising Sales at El Paso for Texas Cities

L. E. Myrick, new business manager of the Sweetwater division of the Community Natural Gas Co., has been made sales supervisor of the Texas Cities Gas Co., at El Paso, Texas. Mr. Myrick has been employed in the Lone Star system since 1929.

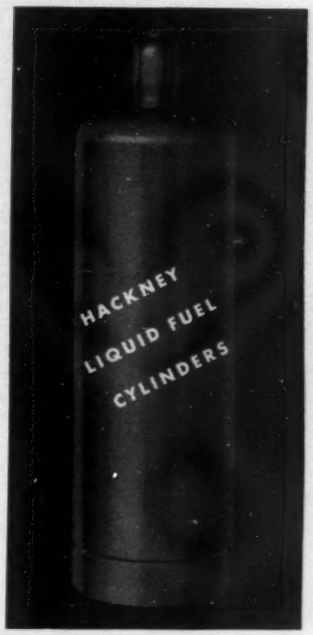
HACKNEY IS PREFERRED

Hackney Liquefied Petroleum Gas Cylinders are *preferred* by leaders in the field.

There are twice as many in service as all others combined.

Long experience, intelligent design, and skillful workmanship have combined to give Hackney Cylinders the ability to out-perform all others.

Virtually every leading firm in the field uses Hackney Cylinders.



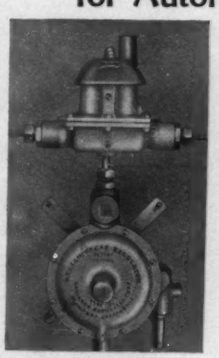
Pressed Steel Tank Company

208 S. La Salle St. Bldg. Room 1185 CHICAGO, ILL.
1363 Vanderbilt Concourse Bldg. NEW YORK, N. Y.
6633 Greenfield Ave. MILWAUKEE, WIS.
666 Roosevelt Bldg. LOS ANGELES, CALIF.

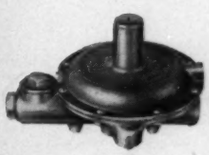
Hackney MILWAUKEE

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

RELIANCE REGULATORS
for Automatic Control of Bottled Gas Fuels



Type MR
Patent No. 1,960,466



On the left is illustrated the spring loaded, canopy type MR Regulator with a secondary type BK Regulator. Above is illustrated the BK secondary type Regulator.

Reliance liquid petroleum gas regulators are recommended in duplex operating types for the best results. The primary MR regulator reduces extremely high pressures encountered in the service cylinder when first installed to an intermediate pressure of from 3 to 10 pounds. The BK regulator then reduces this pressure to a uniform outlet pressure required for proper utilization which insures uninterrupted service to the appliances. The BK regulator can be operated independent of a primary regulator when manifold valves are employed.

Write for Bulletin No. 30 explaining in detail all types of Reliance Regulators and accessories designed for bottled gases.

RELIANCE REGULATOR CORPORATION
1000 Meridian Avenue
Alhambra California

Texas Legislators Move to Halt Natural Gas Wastage

EARLY in May the Texas Legislature passed the Clint C. Small Senate Bill prohibiting wastage of natural gas in all Texas fields, which include the largest natural gas producing areas in existence. Governor Allred's signature to the bill gave it immediate force, and the Texas Railroad Commission conducted hearings during the month to secure data on which to base an order preventing physical waste and prorating production in line with market demand.

Wastage of a billion feet of gas daily from the Panhandle field alone for many months past has called for a strict legislative curb, and it is strongly hoped that the Texas Railroad Commission will administer the new measure in such a way as to halt this economic loss.

The new law calls for ratable takings, prohibits blowing residue gas from which gasoline has been extracted, and also prohibits burning sweet gas for carbon black. Residue gas not put to other lawful use must be reintroduced into gas or oil horizons. The 2-year old sour-gas law, under which the wastage abuses developed, is repealed by the new legislation.

Wastage expressly prohibited includes operation of wells with inefficient gas-oil ratio, drowning commercial gas-producing strata with water, underground waste however caused, permitting any well to burn wastefully, creating unnecessary fire hazards, unnecessary physical waste incident to drilling operations, producing gas in excess of transportation or market facilities or reasonable market demand.

Use of sweet gas is forbidden except for light or fuel, for efficient chemical manufacturing other than for carbon black production, for reintroduction of gas into oil or gas bearing horizons to maintain or increase rock pressure, or for extraction of natural gasoline when residue gas is returned to horizon from which it is produced.

Gasoline content of sour gas must be removed before the gas may be used for carbon black manufacture.

The ratable taking phase of the law is designed to make appurtenant to every well all the gas that is contained within its drainage area, as gauged by potentiality of the well and the surface area attached to the well. Those owning acreage in a proven gas field must drill a well and produce gas to bring themselves under the allowances of the bill, and when they do so are entitled to pipe line connections together with a ratable part of the market served by the pipe line.

Provisions against physical waste under the law take effect August 1 as regards sweet gas, and on October 1 as regards sour gas.

In requiring that sweet and sour gas and casinghead gas be put to legitimate use following extraction of gasoline content, the new law is a tremendous advance over the old, and if properly administered should bring Texas definitely within the ranks of states enjoying proper conservation measures.

"Clean Sweep" on Househeating Prospects in Chicago

IN a "Clean Sweep" sale held during the month of April, the Peoples Gas Light & Coke Co. asked its 4,000 employees to make a special effort to turn in the names of prospects for househeating.

Not only did the "Clean Sweep" in this case mean a last round-up of prospects before summer, but it carried the thought of removing dust and dirt from homes through the agency of clean gas heat.

In presenting the campaign the economy of gas for househeating has been impressed upon employees, one of the most convincing arguments being a set of figures indicating what it formerly cost to heat a home with gas, in comparison to the present day cost. From June 16, 1920, to February, 1921, the average cost of heating a home with gas in Chicago was $426.25 for the season. The present cost would be approximately $140 for the season.

This and other points have driven home to the employee that he can utilize every opportunity to recommend the economy of the fuel to his friends and to those with whom he spends his money.

Although it was the expressed desire of the management of the company that all employees participate in the campaign, yet the plea was made wholly on an invitational basis, as providing a splendid means of cooperating with the company.

Indicating the response on the part of the employee, the first 11 days of the campaign yielded 3,364 prospects turned in by 1,640 employees.

The goal sought was to have 100 per cent of the employees turn in at least one prospect. In the first 11 days every man in two departments of 180 men each had turned in prospects. One of these departments had turned in 636 prospects.

The new business department of 181 men had accounted for 351 prospects; and 135 employees in the building maintenance department, made up of elevator men and caretakers of the building, had turned in 218 prospects. The stenographic department, made up of 48 employees, had brought in 55 prospects.

Sales have been made, in the first 11 days, to 8 per cent of the prospects turned in. In addition to house heating prospects 293 prospects had been turned in for water heaters, 110 for refrigerators and about 500 prospects for miscellaneous appliances. The new business department also was able to close approximately 8 per cent of these prospects. Employees are paid on prospects which result in sales.

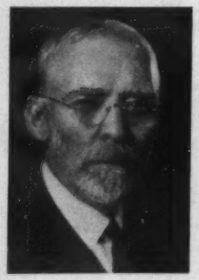
All employees were equipped with booklets on "How to Sell the Story of Gas Heat in Chicago"; and another entitled "What the Records Show About Gas Heating Costs." Also each was given prospect cards which were to be signed by the person inviting the sales representative of the company to call.

Latest revised figures on the campaign showed that 5,601 prospects were received from employees from April 1 to May 10, inclusive. From these prospects 419 appliance sales were reported made. A summary of the sales as of May 15 reported 206 conversion burners, 11 gas designed furnaces, 31 unit heaters, 31 radiators and 140 circulating heaters.

F. J. Petersen of the company directed the drive as campaign coordinator, operating under the sales division of the company of which T. V. Purcell is vice-president.

John F. Parker of Roper Organization Passes Away

JOHN F. PARKER, associated for 35 years with the Geo. D. Roper Corp., died at his home in Rockford, Ill., May 9.



John F. Parker

Mr. Parker was born in Henderson, Ky., in 1858, and was an intimate friend of the late Geo. D. Roper. Because of his long and successful record in promotion of gas range sales, which took him into every section of the country, Mr. Parker earned the title of "Dean of American gas range salesmen." He was in great demand as a speaker at gas association conventions and numbered his friends in the industry by the hundreds.

United Erecting Second Gasoline Plant in Rodessa Field

In the Rodessa Field, La., United Gas System is erecting its No. 2 gasoline plant. The site is the same as that for the No. 1 plant, located on the Caddo Parish (La.) and Cass County (Texas) line in the extreme northwestern section of Louisiana.

The 12-inch field line from Rodessa field to United's main line, running about 14 miles southeast, is being looped and will be completed in June.

Addition of a 30,000 cubic foot unit is doubling the gas capacity of the company in the Rodessa field. Gasoline content of the gas runs 1 gallon per M c. f. Completion of the plant is scheduled sometime before the middle of June.

Republic Double Strength Steel New Alloy Product

A high tensile steel product named Republic Double Strength Steel has been developed by the Republic Steel Corp. of Youngstown, Ohio. The new steel is a copper-nickel-molybdenum ferrous alloy with a high yield point and tensile strength. The product is made in two carbon ranges and is available in the usual commercial forms. It can be arc, gas or spot welded without loss of ductility at or adjacent to the weld.

Gas in El Segundo Refinery

Standard Oil Co.'s El Segundo refinery, one of the two largest on the Pacific Coast, has begun using gas in quantity for boiler fuel and other uses. Southern California Gas Co. which is supplying the refinery expects usage to run as high as 12 million feet daily.

MEASUREMENT and CONTROL

Some Factors and Trends in Domestic Meter Maintenance

By R. W. McClenahan

*Assistant Manager, American Meter Company, Philadelphia, Pa.**

METER maintenance is defined as all operations that are concerned with improving and sustaining the performance of meters on the gas distribution system. A complete aspect of these operations includes certain policies and practices of both the distribution and administrative departments, in addition to the important functions of the meter department.

R. W. McClenahan

Meter performance is defined as the percentages of total incoming meters in each test class. Operating revenue is dependent on correct meter performance and, as the meter continuously resides on the customer's premises and monthly touches his pocketbook, its accuracy is a vital factor in public relations.

Another important factor is the cost of measurement per meter year or per thousand cubic feet of gas sold. This cost is receiving increased recognition as distinguished from unit repair costs, which are of prime importance to the repair department, but must be considered as a part of the total "Measurement Cost" figure.

The correct solution to the whole problem of meter maintenance becomes a creative function. It involves the selection of a desired standard of performance and the further selection of those characteristics of performance which contribute to that standard and the rejection of those which detract from it. The result places the greatest possible number of correct meters in service over the longest economical period. In such an achievement there is no ground for haphazard or rule-of-thumb methods. It is a scientific problem calling for scientific analysis.

The simplest and earliest type of performance analysis consists in recording the incoming test of all meters and at the end of a given period of time, usually a year, these are combined by classes (correct, fast, slow, stuck and non-register) to give the number of meters and the percentage of total meters in each test class. A further step consists in balancing the fast and slow inaccuracies to secure the average error, or accuracy of registration, for all the meters tested. Such figures obviously represent the average performance of meters returned from a system and tested. They show a cross-section performance of the "samples" removed from the system and, as such, they are of real value. As sources of operating information, however, they do not show sufficient data for the determination of operating policies, since average performance of the whole group is made up of the combined performance of separate groups, some of which show good performance and others show poor performance.

There is available today a foundation of actual company experience on which to build. Proven record systems are available. Performance data, requiring many years to assemble, are at hand as useful signposts, furnishing the inpetus and example of past achievement. We have the further advantage of being able to combine statistical results from several companies to give composite performance data. This minimizes or even eliminates local factors and, within the scope of the analysis, indicates the presence of general performance trends and the nature of these trends. Much of this past experience and recorded data has been analyzed with this in view, and it is interesting to note certain points which appear to be clearly developed.

1. There is further confirmation of the divergent group performance figures which compose the general average figure.

2. There is ample supporting evidence of earlier conclusions that meter age, regardless of intervening repair, is a primary factor in performance results.

3. Deviations from correct proof, both fast and slow, appear according to a fairly regular pattern through the life of the meter. These deviations occur both in the spreads of the proof zones and in the number of meters in each zone.

4. Based on this pattern, the average error shows a definite trend and we find instances where the average error for a particular group is over three times as great as that for the whole group, and from five to eight times as great as those of other groups taken in the total.

5. Class of repair and intervening service are definitely reflected in performance results. The importance of this information is that it provides the key to the correct application of a specific class of repair, based on past history of repair and future expected service. Successful meter repair should include the principle that when a meter leaves the shop it will render satisfactory service until its next periodic inspection.

6. The unit repair cost is directly related to the correct performance. The association of correct performance with the amount of overhauling necessary, seems quite logical and has been recognized in many quarters.

7. This inverse relationship of correct performance and repair cost is further confirmed in the analyses of groups of meters over an extended period of time. In this case the maintenance cost is resolved into cost per meter year of service and it is found that as the correct performance declines the maintenance cost per year increases.

*Abstract of paper presented before 12th Annual Distribution Conference, American Gas Association, held at Cleveland, Ohio, May 2-4, 1935.

New Orifice Meter Data Discussed Before S. C. M. A.

TWO speakers made the May 23 meeting of the Southern California Meter Association of high interest to the good crowd which gathered at Lakewood Country Club, near Long Beach, for the dinner session.

F. A. Hough, distribution engineer for Southern Counties Gas Co., dealt with the proposed methods of computing orifice meter coefficients, using the new A.G.A.-A.S.M.E. data. Mr. Hough is chairman of the joint committee of interested west coast associations, which is now developing a standard procedure for orifice meter measurement in California on the basis of the new data.

The second speaker was George Stahlman, deputy district attorney in Los Angeles, who spoke to the S.C.M.A. a year ago and returned to entertain the group again with "behind the scenes" sidelights on what takes place in the criminal courts of today.

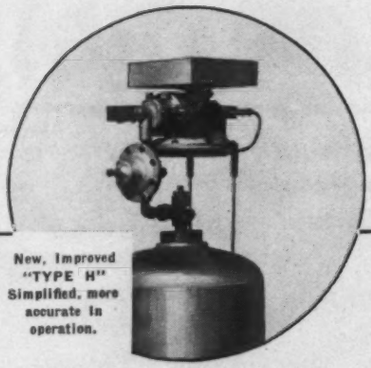
Walworth Company Develops New "Hi-Test" Cast Iron Pipe

The Walworth Company, 60 East 42nd St., New York, N. Y., has recently announced the development of a new product, named "Hi-Test" Cast Iron Pipe. The new pipe is furnished in sizes 1¼-inch to 6 inches inclusive, in 20-foot lengths, with threaded joints for rapid assembly above ground, and can also be supplied in 5-, 10- and 15-foot lengths.

Cast iron used in the new product has an ultimate tensile strength of 35,000 pounds per square inch. Minimum bursting pressures for the threaded pipe range from 7,000 pounds per square inch for the 1¼-inch diameter size to 1,500 pounds per square inch for the 6-inch size. A bulletin giving complete specifications is available on request to the company.

New Household Rate

The Santa Maria (Calif.) Gas Co. has established optional rate schedules for domestic consumers incorporating reductions where a large quantity of gas is used. The new rate schedule offers a reduction of from 2 cents for 2,600 cubic feet to $2 for 10,000 cubic feet monthly. A two-year contract is necessary to secure the reduced rates.



New, Improved "TYPE H" Simplified, more accurate in operation.

GASAIR

By-pass Eliminator

STANDBY UNIT

for Bottled Gas

This sturdy emergency-unit, **absolutely dependable,** screws firmly into regular tank valve, and is stoutly braced. Easily transported, and handled by one man.

Furnishes a propane-air mixture that temporarily replaces either natural or manufactured gas **without necessitating burner adjustments.**

Indispensable to gas companies! Insures better service to customers. Saves time. **Costs less than running a by-pass.**

Clip this ad and send for prices, full particulars

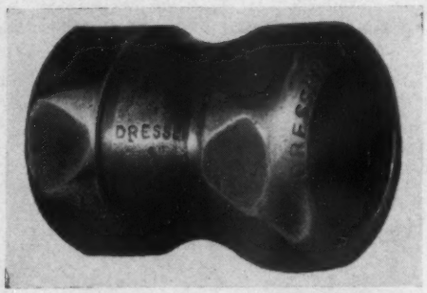
Utility Development Co.

John K. Heller, President

5815 Third Street San Francisco

New Pipe Coupling Developed by Dresser Mfg. Co.

SEVERAL unusual features are incorporated in a new, self-contained pipe joint just announced by the S. R. Dresser Manufacturing Co. of Bradford, Pa. To make a connection with this new joint, which the company calls the Dresser Style 65 Compression Coupling, nothing is needed, according to the manufacturer, except the pipe, the joint itself and an ordinary wrench. Plain end pipe is used, no special preparation of the pipe ends—such as threading, grooving, or flaring—being necessary. Making the joint simply involves inserting the pipe ends into the coupling (which comes assembled) and then tightening two threaded octagonal nuts with a wrench. The resulting joint is permanently tight, absorbs normal vibration, expansion and contraction movements, and permits deflections of the pipe in the joint.



Other advantages of the new product are that the pipe need not be cut to exact lengths; joint making in cramped quarters is simplified; repairs on old lines can be quickly and easily made; and the joint is suitable for exposed lines because of its compact appearance.

The new coupling is supplied in standard steel pipe sizes from ⅜-inch I.D. to 2-inch I.D. inclusive, black or galvanized. It is recommended for all types of services. The gaskets, which are provided with a flexible, metallic, patented armor in the tip, are suitable for temperatures up to 200° F.

Record Attendance at Southwestern Gas Measurement 1935 Short Course

A NEW attendance record was established at the 11th Annual Southwestern Gas Measurement Short Course, in Norman, Okla., April 23-25, with a registration of 575 from 23 states and three foreign countries. States represented at the Short Course sessions were Alabama, Arkansas, California, Colorado, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, Ohio, Oklahoma, Pennsylvania, Texas, West Virginia, and Wisconsin. The three foreign countries represented were British West Indies and Island of Trinidad, Mexico, and Persia.

R. D. Turner of the Skelly Oil Co., Tulsa, Okla., chairman of the 1935 Gas Measurement Short Course, has been made chairman of the General Committee for 1936. W. H. Carson, professor of mechanical engineering and head of the School of Petroleum Engineering, is director of the course.

Modernize *with* DANIEL ORIFICE FITTINGS

THE "SENIOR" TYPE—by a series of gears and one wrench, orifice plate in line can be changed under pressure in less than three minutes. Eliminates expense of a by-pass. Occupies less space in the line. Works equally well on air, steam, dry gas, wet gas, or corrosive gas.

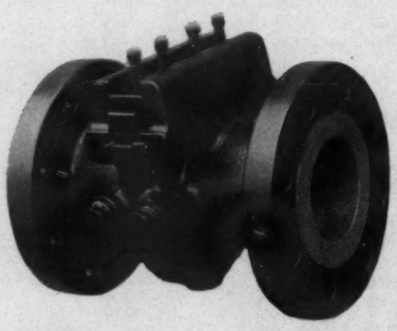
THE "JUNIOR" TYPE—same as Senior Fitting, except does not have upper equalization chamber and cannot be changed under pressure. Is less expensive.

DANIEL

ORIFICE FITTINGS

2719 ELM ST., LOS ANGELES

MADE IN ALL SIZES AND PRESSURES. WRITE FOR PRICES AND DETAILS



"Junior" Type Orifice Fitting

Northern Utilities Co. Offers Reorganization Plan

The Northern Utilities Co., Casper, Wyo., has filed reorganization proceedings under the amended bankruptcy act in the Federal District Court at Cheyenne, Wyo. The court has ordered that the company may continue to operate its properties until reorganization is perfected.

Northern Utilities Co. is an operating company distributing gas to Mills, Casper, Lander, Riverton, Glenrock, and Rock Springs, Wyo. Late in 1934 the company, formerly a holding company, took over its operating subsidiaries, the New York Oil Co. and the Central Pipeline Co. Northern Utilities Co. is controlled by the Chas. A. Munroe interests of New York.

New Location for Missouri Natural

The Missouri Natural Gas Co., headquartering in Poplar Bluff, Mo., has leased the Farmers Bank Building in Farmington, Mo. as new location for the company's district offices which have been in the Tetley building since the district was organized several years ago. The bank building is being completely renovated. J. M. Foxx is district manager for the company.

BUILD YOUR HOUSEHEATING LOAD WITH KLIXON CONTROLS

DIAPHRAGM *Room Thermostat*

These two advanced Klixon devices give exact automatic temperature control and assure positive pilot protection for your gas-fired space heaters . . . provide sales features that make it easy to sell gas heating.

Write today for descriptive bulletins.

PILOT *Safety valve*

SPENCER THERMOSTAT COMPANY

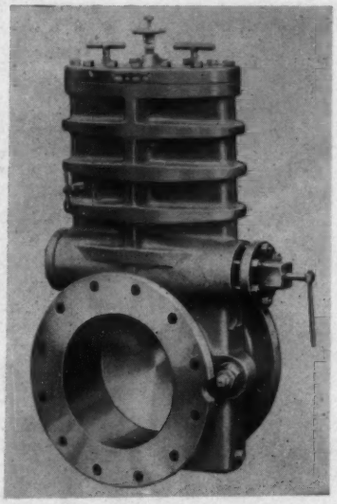
Unit of Metals & Controls Corporation

34 FOREST STREET • ATTLEBORO, MASSACHUSETTS

Foxboro Has Exclusive Agency for "Commercial" Orifice Fitting

Announcement has been received of the appointment of The Foxboro Co. as sole distributors of "Commercial" Orifice Fittings, made by the Commercial Iron Works of Los Angeles, Calif.

Design of the Commercial Orifice Fittings features the elimination of by-passes together with a considerable saving in space in installation. The threaded elevator lift permits lowering or lifting of orifice plates regardless of line pressure, without shutting down the line and with complete safety to the operator. The orifice plates are accurately centered and screws in pressure areas are eliminated. Complete details will be sent on request to The Foxboro Co., Foxboro, Mass.



The "Commercial" Orifice Fitting

Portland Gas & Coke Co. Establishes Independent Customers' Dept.

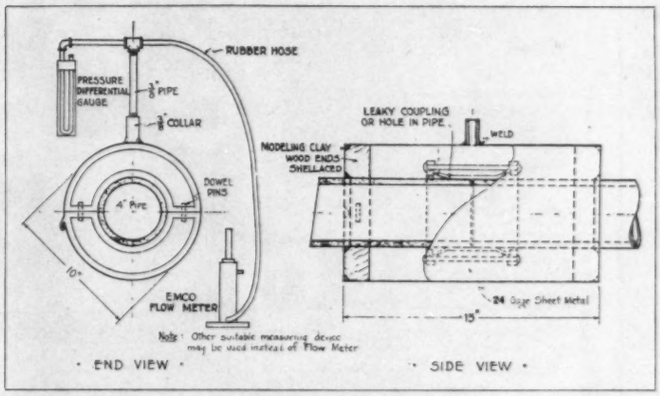
The Portland (Ore.) Gas & Coke Co. has established an independent customers' office on the first floor of the Public Service Building. Transactions were formerly made on the second floor of the building where the department was a joint organization with the Northwestern Electric Co. and the Pacific Power and Light Co. The change in the set-up of the customers' office is but one of the changes made in the reorganization plan of the companies to eliminate most joint departments.

To Publish Bulletin for Southern Home Service Directors

Albertine Berry, Dallas (Texas) Gas Co., chairman of the Southern-Southwestern Group of Home Service Directors, organized at the recent Southern Gas Association convention in Dallas, plans to publish a monthly bulletin which will cover news and ideas applicable to home service departments of gas companies. The first issue of the bulletin is scheduled to come off the press June 1. Home service directors throughout the southern territory will contribute to the bulletin.

ILLUSTRATIONS

Sketch at right and photograph below show equipment for determining rate of leakage from a leaky coupling or hole in pipe.



Checking Losses From Pipe and Coupling Leaks

By H. F. Thompson

General Inspector, The Ohio Fuel Gas Company, Columbus, Ohio

From time to time, in considering costs of repairs to pipe lines, it is necessary to have definite data pertaining to leaks and the quantity of gas lost through various sizes and kinds of leaks. To acquire this data, we originally use a heavy iron split sleeve with the necessary connections for measuring devices. Needless to say, this equipment was very difficult to move, and the process of setting up the apparatus was slow and required several men to handle successfully. Even with this cumbersome equipment, the results obtained indicated that further study would be of value, providing a more portable equipment could be obtained. A rubber sleeve was next tried. This consisted of a rubber cylinder around the pipe, with the seam cemented with rubber cement and the ends clamped to the pipe with a special clamp. A connection was provided for the meter by using a regular valve stem in the rubber cylinder. Considerable trouble was experienced with this equipment, and from these beginnings the sheet metal sleeve described below was developed.

The sleeve assembly consists of a pair of turned wooden ends which are split and doweled together, with the joints and outer and inner circumferences beveled as shown on sketch. The sleeve casing is a piece of 24-gauge sheet steel which is bent to shape and the ends crimped as illustrated. The ends of the tube thus formed are then belled slightly to facilitate the insertion of the end pieces and a 3/8-inch collar is brazed into the cylinder at a convenient location.

In use the metal cylinder is placed about the pipe and the crimped edges slipped together; the end pieces are then placed around the pipe and pushed into place. The joints are now sealed with modeling clay or wax and the measuring devices connected. The sleeve illustrated was made for 4-inch pipe diameter, but with additional end pieces may be used with 2- and 3-inch pipe.

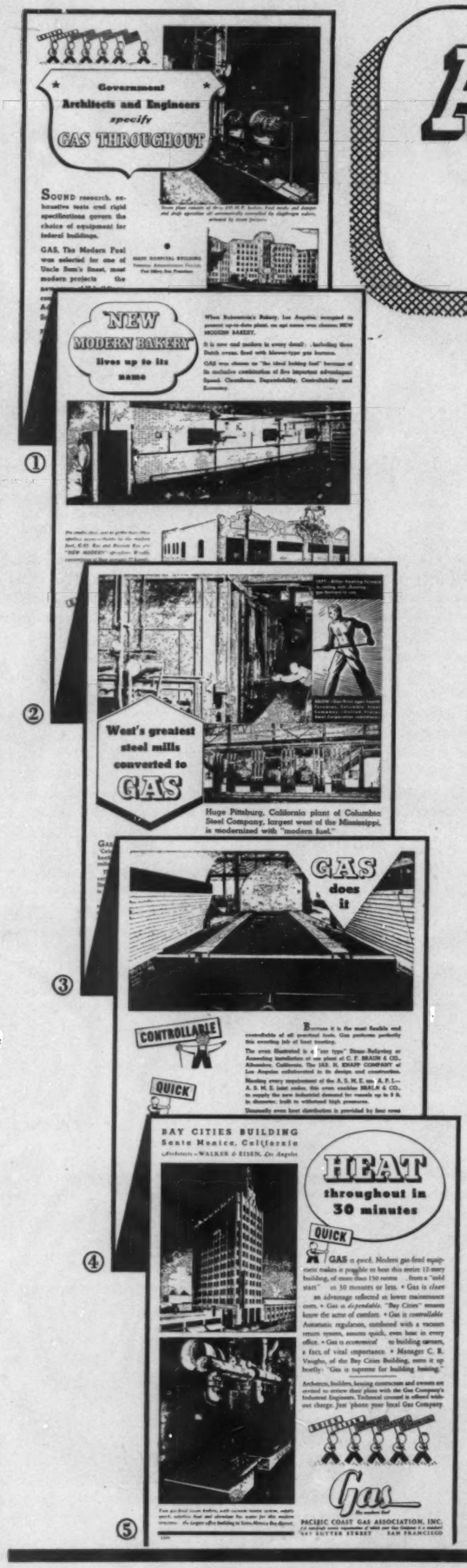
If the line to be tested is a buried one, the leak is barred and classified at the surface as flash, small or large before the bell hole is dug. On surface lines the leak is located and classified with soapsuds before proceeding with the test. The sleeve is then assembled and sealed as mentioned above, and the meter is connected with rubber hose. The meter used depends on the size of the leak. We have found that a 2-light and 5-light test meter and an Emco flow prover will handle the various size leaks in a satisfactory manner.

To date some very interesting data have been accumulated on the variation in rates of leakage for flash, small and large leaks as identified from the surface or with soapsuds on exposed lines, and it is believed when this study is concluded a clearer picture of line loss due to small leaks will be obtained.

North Central Gas Co. to Lay 150-mile Line

The North Central Gas Co., Casper, Wyo., has under consideration the early construction of a 150-mile natural gas transmission line, to connect Clayton, Wyo. to Bridgeport, Neb., at an estimated cost of $1,200,000. Twelve-, 10-, 8- and 6-inch pipe will be used in the construction. Natural gas is now being brought into Nebraska by the company through a line leased from the Standard Oil Co. of Indiana, who plans to use the line to transport crude oil.

A "TICKET" to Profitown via Salesville


Government Architects and Engineers specify GAS THROUGHOUT
SOUND research, exhaustive tests and rigid specifications govern the choice of equipment for federal buildings.
GAS, The Modern Fuel was selected for one of Uncle Sam's finest, most modern projects the
NEW MODERN BAKERY lives up to its name
①
②
West's greatest steel mills converted to GAS
Huge Pittsburg, California plant of Columbia Steel Company, largest west of the Mississippi, is modernized with "modern fuel."
③
GAS does it
CONTROLLABLE
QUICK
④
BAY CITIES BUILDING
Santa Monica, California
HEAT throughout in 30 minutes
QUICK
GAS is quick. Modern gas-fired equipment makes it possible to heat this entire 12-story building, of more than 150 rooms ... from a "cold start" in 30 minutes or less. • Gas is clean ... an advantage reflected in lower maintenance costs. • Gas is dependable. "Bay Cities" tenants know the acme of comfort. • Gas is controllable. Automatic regulation, combined with a vacuum return system, assures quick, even heat in every office. • Gas is economical ... to building owners, a fact of vital importance. • Manager C. B. Vaughn, of the Bay Cities Building, sums it up briefly: "Gas is supreme for building heating."
Architects, builders, heating contractors and owners are invited to review their plans with the Gas Company's Industrial Engineers. Technical counsel is offered without charge. Just phone your local Gas Company.
Gas
PACIFIC COAST GAS ASSOCIATION, INC.
447 SUTTER STREET SAN FRANCISCO
⑤

THE Gas Industry of the Coast has traveled far during the past six years in the fields of commercial and industrial utilization.

Paralleling this same period of greatest development (featuring the expansion of natural gas facilities in California) a powerful force has been **continuously** at work —the Cooperative Advertising and Publicity of the P. C. G. A.

Again this year, nearly 50 advertisements, featuring prominent gas users and their testimonials, are appearing in 16 business and technical magazines, covering 10 "key" classifications.

Is it mere coincidence that sales-resistance to gas fuel has all but disappeared in the territory covered by this trade journal advertising? Or is the advertising working (as it has worked for six years) hand-in-hand with the able sales organizations that are converting the West to GAS?

(1)

The new Veterans' Administration Facility, Fort Miley (San Francisco) with its 18 buildings, is completely gas equipped. Advertisement for Architects' and Builders' magazines.

(2)

"Western Baker," leading trade journal in its field, with Coast-wide coverage, carries this ad featuring the New Modern Bakery, Los Angeles — another plant that's all gas.

(3)

"West's Greatest Steel Mills Converted to Gas"—how Columbia Steel Co. has modernized its Pittsburg, Calif., mills. An ad for "Western Machinery & Steel World."

(4)

"Gas Does It"—performs perfectly an exacting job of heat treating at the plant of C. F. Braun & Co., Alhambra, Calif. —as this ad informs other prospective gas users.

(5)

The superior speed of gas is emphasized in this message concerning Santa Monica's 12-story Bay Cities Building — a recent commercial heating job.

—Cooperative Advertising Committee

(A. C. JOY, P. G. & E., Chairman.)

—Publicity & Advertising Section

(J. S. SPAULDING, L.A.G.&E. Co., Chairman.)

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street San Francisco

With the ASSOCIATIONS

Advertising Men Hold Session in June at Chicago

PUBLIC utility advertising executives from all parts of the country will gather in Chicago June 9-12 for the annual meeting of the Public Utilities Advertising Association which will be held in conjunction with the convention of the Advertising Federation of America. Henry Obermeyer, of the Consolidated Gas Co. of New York, is president of the Association.

Winners in the Association's Better Copy Contest, in which 50 member companies submitted samples of their newspaper, direct mail and outdoor advertising, will be announced at the convention.

The Association will confine its meetings to one day, June 11, enabling delegates to attend the general sessions of the Advertising Federation of America. Sessions will be at the Palmer House. The day's program follows:

Opening remarks: President Henry Obermeyer.

Cooperative Advertising: A. C. Joy, Pacific Gas and Electric Co.

Report on Mechanical Costs.

"Radio Advertising for Utilities": C. A. Tattersall, Assistant Vice-President, Niagara Hudson Power Corp.

Luncheon: Several utility radio program transcriptions to be played (arranged by Batton, Barton, Durstine and Osborn Corp. through courtesy of Niagara Hudson Power Corp.).

"Advertising In Connection with Rate Reductions": Tom Kettle, Advertising Manager, Northern States Power Co.

Report of Better Copy Committee: D. D. Parry, Central Hudson Gas and Electric Co.

"The Appearance of Utility Advertisements": Vaughn Flannery, Vice-President and Art Director, Young and Rubicam.

Report on Chicago Utility Consumer Survey.

Reports and Election of Officers.

This program was developed by a committee of which J. R. Pershall, Public Service Co. of Northern Illinois, is chairman. Assisting him are T. P. Pfeiffer of Byllesby Engineering and Management Corp.; C. W. Tennant, Western United Gas and Electric Co. and Leo Rosenberg of Lord and Thomas. Other preparations for the convention are under the direction of E. Frank Gardiner of the Commonwealth Edison Co., Chicago.

Calendar

June

State Utility Commission Engineers—National Bureau of Standards, Washington, D. C., June 6-8.

Public Utilities Advertising Association—Chicago, Ill., June 11.

Canadian Gas Association—Annual Convention, Montreal, Quebec, Canada, June 10-11.

American Society of Mechanical Engineers—Semi-Annual Meeting, Hotel Gibson, Cincinnati, Ohio, June 19-21.

Michigan Gas Association—Annual Convention, Hotel Pantlind, Grand Rapids, Mich., June 20-22.

American Home Economics Association—Annual Meeting, Chicago, Ill., June 24-28.

Southern California Meter Association—Lakewood Country Club, Long Beach, Calif., June 27, 1935.

July

P.C.G.A. Northwest Regional Conference—Tacoma, Wash., July 11-12.

August

American Chemical Society — Annual Meeting, San Francisco, Calif., week of August 19.

September

Pacific Coast Gas Association—Annual Convention, Hotel Huntington, Pasadena, Calif., September 17-19.

October

American Gas Association—Atlantic City, N. J., October 14-18.

November

American Petroleum Institute—16th Annual Meeting, Biltmore Hotel, Los Angeles, Calif., November 11-14.

Mid-West Gas School and Conference—Iowa State College, Ames, Iowa.

Tentative Program Set for Northwest Conference

A TENTATIVE program for the Northwest Conference of the Pacific Coast Gas Association has been released from P.C.G.A. headquarters. The meeting is scheduled at Tacoma, Wash., on July 11-12, and the program as arranged at present stands as follows:

Opening Remarks: Wm. Moeller, Jr., president, Pacific Coast Gas Association.

The Reduction of Production Costs: Geo. R. Horning, general superintendent, Seattle Gas Co.

Substitution of Butane-Air for Other Types of Manufactured Gas: J. A. Ward, president, Republic Electric Power Corp.

Competitive Rates: (Speaker to be selected).

Tying in with F.H.A.: Jas. F. Pollard, vice-president and general manager, Seattle Gas Co.

Developing Sales Leads: W. C. Mainwaring, merchandise manager, British Columbia Electric Railway Co. Ltd.

Results with Rental-Sales Plan: B. H. Parkinson, commercial manager, Portland Gas and Coke Co.

Results from Dealer Cooperation: J. King Bryon, managing director, Oregon Gas Appliance Society.

The Utility Advertising Problem: (Speaker to be selected.)

Organizing Employees for Load Building: E. J. Ludeman, commercial manager, Washington Gas and Electric Co., Tacoma, Wash.

Sales Wrinkles:

Large vs. Small Cooking Schools: R. W. Coblentz, Washington Gas and Electric Co.

Homemakers' League: J. F. Pollard, Seattle Gas Co.

"Free Gas" Offer: H. L. Farrar, Coast Counties Gas and Electric Co.

Competitive Sales Contests: N. O. Fratt, Seattle Gas. Co.

A feature of the Conference will be a Symposium on Service, to be led by C. R. Miller, superintendent of utilization, Portland Gas and Coke Co. Topics to be discussed under this symposium will include matters of operation which fall outside the sales department but which affect the satisfaction consumers derive from gas service. Among them are included maintenance of purity and pressure of gas supply, handling applications for service, billing, character of appliances, appliance installation, adjustment, follow-up on sales, extensions, home service, etc.

In addition to the noon fellowship luncheons scheduled for each day of the Conference, a dinner dance has been programmed for 6:30 P. M. on the evening of July 12.

Program of Michigan Gas Association June Meeting Announced

Program of the Michigan Gas Association annual convention scheduled for June 20-22 at Grand Rapids, Mich., has been announced by Albert G. Schroeder, secretary-treasurer of the Association. Hotel Pantlind has been designated as headquarters for the meetings.

On the first evening of the convention the Association will meet jointly with the Michigan Electric Light Association, at which time Frank A. Newton of the Commonwealth & Southern Corp., and A. C. Marshall, vice-president and general manager of the Detroit Edison Co., will address the members.

The Michigan Gas Association program includes these features:

Address of President Dan W. Hayes, Superintendent Gas Division, The Detroit Edison Co.

Report by Professor Alfred H. White, University of Michigan, on the Michigan Gas Association Fellowship work during the past year.

The Outside Viewpoint: by Frank W. Steere.

Summer Air Conditioning: by Major W. E. Stark, The Bryant Heater Co.

Safety as Related to Gas Plant Operations: by Herbert D. Straight, Superintendent of Manufacture, Grand Rapids Gas Light Co.

Safety in Distribution and on Customers' Premises: by Arthur H. Anderson, Superintendent of Distribution, Detroit City Gas Co.

Getting and Holding the Industrial Load in the Smaller Properties: by Homer T. Hood, Benton Harbor, Michigan Fuel & Light Co.

Campbell General Chairman for P.C.G.A. 42nd Convention

GEORGE S. Campbell, Pasadena district manager for the Los Angeles Gas and Electric Corp., has been persuaded by President Wm. Moeller, Jr. of the Pacific Coast Gas Association to act as general chairman for P. C. G. A.'s 47th Annual Convention, dated for September 14-17 in Pasadena. Sessions will be at the Huntington Hotel.

Geo. S. Campbell.

Mr. Campbell has been connected with numerous former conventions in Pasadena for the Association, in charge of transportation, hotel arrangements, and entertainment, and is a fortunate choice for this year's general chairmanship. For the past four years he has been district manager for the L. A. Gas and Electric at Pasadena, and has a background of 32 years service with L. A. G. and E. and predecessor companies in the Pasadena area.

$40,000 Replacement Program

Billings (Mont.) Gas Co., affiliate of the Ohio Oil Co., has approved a $40,000 replacement and betterment program for its distributing system at Billings.

Canadian Gas Association Meeting in June

THE Canadian Gas Association is holding its 28th annual convention in Quebec City, June 10 and 11. Chateau Frontenac Hotel has been selected as official Association headquarters during the meetings. The sessions will take the form of discussion groups, according to G. W. Allen, secretary-treasurer of the Association, and among the papers to be presented will be the following:

"Coal Tar as a Boiler Fuel," by C. W. Delorey, Quebec Power Co.

"An Electric Gas Generator," by Ivar Hole, M.N.I.F., Norway.

"Load Building Gas Rates," by K. L. Dawson, Nova Scotia Light & Power Co., Ltd.

"The Use of Manufactured Gas in Industrial Bake Ovens," by J. Fremont, B. C. Electric Railway Co., Limited.

"Meter Diaphragms," by E. J. Turley, Montreal Light, Heat & Power Consolidated.

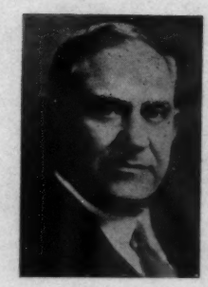
"Benzole Recovery," by G. W. Page, Montreal Coke & Manufacturing Co.

"Outdoor Gas Works," by Henry Underhill and S. W. Randolph, Bartlett Hayward Co.

"Extreme Low Temperature Effects on Gas Mains and Works," by A. E. Paul and H. Dunderdale, gas division, Winnipeg Electric Co.

"Industrial Fuel Applications," by O. L. Maddux, United Gas & Fuel Co. of Hamilton, Ltd.

Included in the entertainment program are visits to Montmorency Falls, Kent House, Ste. Ann de Beaupre, Quebec Bridge, and other interesting points.



C. E. Michel

Fred Karr

Missouri Association of Public Utilities Elects Officers

C. E. MICHEL, Union Electric Light & Power Co., St. Louis, Mo., was elected president of the Missouri Association of Public Utilities at its annual convention, held April 24, 25 and 26 at Kansas City, Mo. Fred Karr, retiring president, was elected a member of the executive committee.

Other new officers elected for the coming year were: 1st vice president, C. F. Farley, Kansas City Power & Light Co.; 2nd vice president, Ben C. Adams, Gas Service Co., Kansas City; 3rd vice president, E. H. Lewis, St. Louis County Gas Co., Webster Groves; treasurer, Hermann Spoehrer, Union Electric Light & Power Co., St. Louis; secretary, N. R. Beagle, Missouri Power & Light Co., Jefferson City; assistant secretary, Jesse Blythe, Jefferson City; managing director, E. A. Beer, Jefferson City.

A Safety Meeting was a new feature of the convention this year, and a statewide program of active work in accident-prevention was tentatively outlined for the coming year, to be carried out by a committee headed by J. M. Strike, St. Joseph, Mo., as chairman.

A total of 271 delegates representing the member companies attended the convention.

Soil Corrosion Conference Dated for July 23

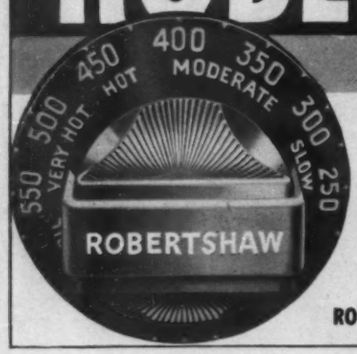
ANOTHER of the soil corrosion conferences held annually in Los Angeles for the past several years will be conducted on July 23, in conjunction with the west coast visit of Dr. Scott Ewing, A. G. A. research associate with the National Bureau of Standards.

Subjects of current interest on pipe corrosion protection will feature the program, and it is planned that speakers from oil, water, and gas pipe line properties will contribute experience from these industries.

This year the meeting is sponsored by the Pipe Protection Sub-committee of the Pacific Coast Gas Association of which Arthur B. Allyne is chairman. Arrangements for the program are being handled by Mr. Allyne in cooperation with W. M. Henderson, superintendent of gas distribution for the Los Angeles Gas and Electric Corp., who has been in charge of previous corrosion conferences in Los Angeles.

The meeting will be held at Los Angeles Gas and Electric Corp. auditorium in Los Angeles, further details of program to appear in *Western Gas* for July.

U. S. SUPER de LAVAUD
"Impact Resistance Doubled"
◆
Made by
U. S. PIPE & FOUNDRY COMPANY
BURLINGTON, N. J.
Sales Offices and Foundries throughout the United States

ROBERTSHAW
THERMOSTATS


Over two million in daily use on gas ranges. Hundreds of thousands in daily use on water heaters, space heaters and every type of gas appliance.
Dependability Counts!
ROBERTSHAW THERMOSTAT COMPANY · YOUNGWOOD, PA.

WHY BUY GAS HEATING APPLIANCES *in the summer time?*

Annual Summer

GAS HEAT CAMPAIGN

Commences

JUNE ·1·

Everywhere We Sell Gas

●

WATCH

The P. G. & E. Dealer Bulletin for Details

1 • 10% Summer Discount

2 • Special Easy Terms

3 • Deferred Dating

(until October 1—with option on cash terms at that time)

flash!

Through the co-operation of the American Trust Company and other lending agencies, any home-owner who qualifies for an F.H.A. loan may get a special loan on a Deferred Dating basis. Furthermore, we have arranged to have the minimum on these loans reduced to $35; the monthly payments to $3—with NO DOWN PAYMENT, NO RED TAPE, and NO DELAY!

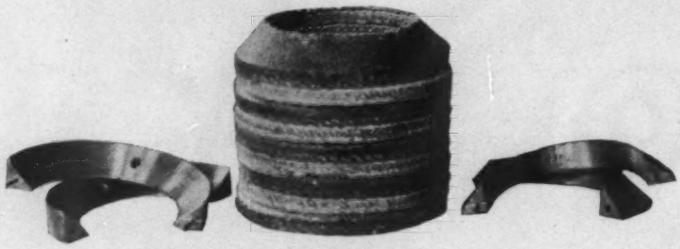
DEALERS

P· G· and E·

PACIFIC GAS AND ELECTRIC COMPANY

(OWNED • OPERATED • AND MANAGED BY CALIFORNIANS)

WG206-635



PATENTED

Accordion Packing

Keeps Friction so Low That You Can Spin a Valve Hand-wheel

Accordion Packing rings can be applied to any liquid, gas or vapor. Their bellows-like construction is unusually sensitive to pressure control. They are valuable for use on pipe line valve stems because they will last almost as long as the valve, and they keep friction at a constant minimum.

If you want more details of this low friction packing, or have a packing problem that you would like solved, write us direct. During the past several years we have helped the largest and smallest companies with their problems. There is no obligation.

THE TEXACONE COMPANY

2007-9 West Commerce **P. O. Box 4186**

DALLAS, TEXAS

Electrogas

FLOOR FURNACES

NEW LOW PRICES

now available on the famous ELECTROGAS FLOOR FURNACES. These prices are the lowest ever offered, and are created to make it especially worth your while to sell Electrogas heating in line with the Federal Government's plan of home modernization.

ALSO AVAILABLE IMPROVED LINES OF "STREAMLINED" BASEMENT FURNACES.

BLOWERS FILTERS AIR WASHERS

BUILT-IN FURNACE—BLOWER—FILTER UNITS

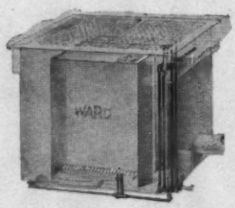
Write for details.

ELECTROGAS FURNACE & MFG. CO.

2575 Bayshore, San Francisco
164 South Central, Los Angeles

For Greater Consumer SATISFACTION
recommend

WARD
FLOOR FURNACES



Build up your consumer satisfaction by recommending "Keep Warm with a Ward". Ward Floor Furnaces are guaranteed 10 years, built for a lifetime. New feature . . . CRADLE CIRCULATION . . . increases air circulation 10% to 15%. Bilt-In Thermo-Control assures uniform temperatures. Constructed of finest Toncan iron . . . WARDS serve every heating requirement and combine efficiency, safety, beauty, and comfort.

Ask us for further information.

WARD HEATER CO.

1800 WEST WASHINGTON BLVD.
Telephone PArkway 9171
LOS ANGELES

Technique of Compressor Station Operation

(Continued from Page 13)

But since the effect of the peaning process, to accomplish this, was to stretch the other surface of the ring between A and B with reference to the inner surface between the same points, we now find the outer surface of the ring from "B" to the gap, now curls in away from the bore (exaggerated in Fig. 3).

It is now a simple matter to leave the ring in the bore and lightly pean the inner surface starting to the left of "B" and moving slowly toward the gap, and to the right of "D" and moving toward the gap, until those short ring ends have been laid back against the cylinder bore within the desired tolerance.

It is obvious that each ring must be peaned in the exact position in which its gap will be placed on the piston, and the piston turned in exact position planned. Then having no more than .002 inch clearance between ring surface and cylinder wall at any point, *a perfect ring fit* may be assured (assuming the surface of the ring is not finished extremely smooth) even before the "idling," limbering up period is complete.

In many instances where the foregoing practice was not used, pistons have never been without a marked "blow-by," and a complete oil film never established, within the life of the set of rings.

But assuming due diligence has been exercised in fitting rings as above described, we are firmly of the belief that if ever rings are found "stock in the groove," groove and butt clearance being in line, it may be traced to one of the following causes:

1. Either too much oil has been delivered to the rings.
2. Or water has leaked into the cylinder.

Lubrication and Lubricating Oils

Force Feed Lubricating Oils

The selection of lubricating oils is of vital importance. Some years ago we awakened to a realization of the fact that 58 different oils were in use in our compressor stations, and that horsepower hours per gallon economies showed a wide range of difference.

Since that time, by carefully studying the records of each oil as to economy versus maintenance cost, all but five of the original 58 have been gradually eliminated, with constantly increasing horsepower hours per gallon and consistently reducing maintenance costs.

Some few plants had been using a single oil for both cylinder lubrication and circulating oil. None of these exceeded the average economy for all plants. Examination of the disbursement of oil in each of these one-oil plants indicated that in each case the oil used was much better suited to one purpose than the other.

The first step was to stop the use in the circulating system of oils which the records showed best suited for use in lubricators, and vice versa, and to substitute an oil which

had a record among the best, for the purpose desired. This examination of records also showed some plants where two oils were used, had one of them used for one purpose, when it was better suited to the other. Thus the elimination of oils proceeded and we now know the remaining oils in use are adapted to the purpose for which they are purchased.

The concrete results of this experience are these firm convictions:

1. The use of an oil for cylinder lubrication in a gas engine, which has a Seybolt viscosity of less than 57 seconds @ 210 degrees Fahrenheit is false economy.

2. The use of an oil for that purpose, having a Seybolt viscosity of more than 75 seconds @ 210 degrees is extravagant and cannot justify the price per gallon.

3. An oil of viscosity ranging between 57 seconds and 75 seconds @ 210 degrees, "flash" and "fire test" and "carbon content" being in line, can be depended upon to give 15,000 brake horse-power hours per gallon, when lubricating both power and compressor cylinders and power and compressor rods with lower maintenance expense than will result from more lavish use of oil.

4. If above figures cannot be attained, the reason is to be found in some faulty mechanical condition, such as ring fit, ring clearance (either end or groove clearance), faulty alignment of piston or failure of force feed lubricator to deliver uniformly.

We find the following ring clearances necessary for four-cycle gas engines:

Groove Clearance

Top or fire ring

No. 1 .008 in. to .010 in.
No. 2 .006 in. to .008 in.
No. 3 .004 in. to .006 in.
No. 4 .004 in.

End of Butt Clearance

No. 1	.006 in. to .008 in.	per diametrical inch
No. 2	.005 in.	per diametrical inch
No. 3	.004 in.	per diametrical inch
No. 4	.004 in.	per diametrical inch

The use of mitre cut snap rings has been discontinued. Ring No. 3 is step cut. Rings Nos. 1, 2 and 4 are square cut.

Circulating Oils

Circulating oils need not have a viscosity of more than 150 seconds (Seybolt) @ 100° since bearings are kept very tight. Usually thoroughly dewaxed paraffine oils are preferable as they circulate more freely at the lowest anticipated engine room temperature, and are more easily cleaned, do not emulsify as readily, and have higher demulsibility. They also distribute more readily, replenishing the film promptly.

Since the circulating oil, unlike the force feed oil, is used over and over many times, whenever the circulating system at any plant fails to show at least three times as many horsepower hours of satisfactory service per gallon, a "Stop the Leak Campaign" is in order. Such a campaign means the careful going over of the following probable leakage sources:

1. Careless measurement and handling.
2. Porous castings, pipe or fittings.
3. Crankcase leaks due to improper gaskets and unnecessary splashing.

Dependable, smooth operation *with*

N.G.E.

Boiler Feed Water Regulator

N.G.E. Gas Burners
N.G.E. Liquid Level Controllers
N.G.E.-WILGUS Gas Fuel and Pressure Regulators
N.G.E. Industrial Furnace Equipment

Write for new Bulletin

N.G.E. Float Operated Boiler Feed Water Regulators are compact and sturdy. They will operate indefinitely with the same degree of accuracy. They are not affected by weather or change in temperature. The valve may be installed anywhere around the boiler, eliminating the necessity of piping feed water to the controller. The pilot supply pressure may be either gas, air or water, of 10 lb. gauge or more.

N.G.E. Boiler Feed Water Regulators are available in either the pilot operated or the direct operated type. Low cost and minimum maintenance expense characterize the installation and operation of both types.

NATURAL GAS EQUIPMENT INC.

Petroleum Securities Bldg.
Los Angeles, Calif.

1123 Harrison St.
San Francisco, Calif.

Arizona Distributors: Crane Co.

LOOK TO THE PIONEERS FOR CONTINUED LEADERSHIP

The ENSIGN
NATURAL GAS CARBURETOR

Asssures easy starting, smooth operation, dependable power, and maximum economy.

Embodies no floating or moving parts. Does not require priming. Special fuel regulator provides accurate control of gas pressure, precise metering of fuel, and prevents waste or loss of power. Two-stage: One for starting and one for operating. Supplied with removable venturis which are available in sufficient sizes for proper fitting to engine speed and piston displacement. Five sizes from 1" to 2" inclusive, either updraft or downdraft. Write for descriptive bulletin.

ENSIGN CARBURETOR COMPANY, LTD.
7010 So. Alameda St. P. O. Box 606, Huntington Park, Calif.

4. Oil wiper rings to prevent crankcase oil being carried into compressor or power rod packing.

5. Excessive gallonage may be carried out daily in the wiping rags.

An excellent method of locating such oil losses is to refrain from wiping up waste oil until the exact source of the loss is determined and necessary steps taken to prevent recurrence of loss.

Having found that an oil suitable for cylinder lubrication was entirely unsuited for bearing lubrication as well as uneconomical, and that a good circulating oil could not properly lubricate the power cylinders and increased maintenance cost more than offset any saving due to lower price per gallon, we venture the following conclusion:

That an oil, in order to serve both purposes satisfactorily, would have to combine the characteristics of a 30 S.A.E. rating @ 210° F., with those of a 10 S.A.E. rating @ 100° F. No such oil was ever heard of until very recently. Oils having such a low viscosity index, so flat a temperature viscosity curve, have only recently been sponsored by research laboratories, and made commercially available, but at a premium price per gallon.

Necessity for Scale-Free Water

It has now become uniformly recognized that water having a hardness of more than 3 grains per gallon should be reduced by some means to less than that figure in order to keep the machinery scale-free. Some waters, of course, can only be treated chemically at a prohibitive cost, in which case, an enclosed system, or as close an approximation thereto as is possible, should be installed. In this connection, water which has been successfully treated with zeolite, or distilled water to which is added a corrosion inhibiter, whichever can be provided with the least expense, should be used for make-up purposes.

Records

The records of a compressor station or department are most essential in order to insure economical operation. The forms for recording the operating information should be simple but sufficiently detailed to give the complete and accurate story of the operation. These operating forms are comparable to the negative in photographic work. Unless the negative is clear the finished print will not clearly indicate how the compressor dollar was spent.

The two monthly operating record forms reproduced with this discussion furnish the pertinent details of the plant operation, which are entered daily on the sheet, and then forwarded monthly to the general office by the plant chief engineer. This furnishes a negative from which a clear picture of the plant's operation can be studied.

The responsibility of the supervisor is to develop the negatives, to bring about uniform results, to eliminate faulty practices, to prevent improper distribution of charges, and duplication of effort and expense. Our experience has been that the most constructive procedure to follow in bringing about uniform economy and efficiency is the compilation of the information obtained from the form "Monthly Operating Record" into a monthly summary of operation. Each plant is then furnished with a copy of this summary. This permits each plant chief engineer to measure his own accomplishment against that of other plants.

From the two forms shown in this paper it is also possible to determine in the general office the service hours made by the various engine parts, as their replacement is indicated on the "Monthly Repair Report." In addition to these two forms a brief synopsis of the operating changes or any deviation from routine is reported in a weekly progress letter.

These records are then compiled into an annual report in which each plant's current year's operation is compared to a 5-year average, as well as to the entire system average. This information permits the steering of a true course and furnishes food for thought and discussion at the weekly plant engineers' meetings.

Weekly Engineers' Meetings

In our organization we have, for years, insisted that the chief engineer of each station designate a certain hour in which to meet with his three shift engineers. This permits of his laying before them any proposed change in routine, new and approved kinks in operation which are to be tried out, outlining any change in plan when the budget is being exceeded, or any program of any sort pertaining to the operation, which has been determined upon. This insures all three shift operators having the same understanding of things, and enables the chief engineer to be sure that all three thoroughly understand just what he wishes to be done and exactly what part each man is to play in that plan. It also offers a rare opportunity to air any fancied grievances, and has always promoted the best of harmony.

PAYNE

Console Heaters

Payne Console Heaters are correctly priced, beautifully finished in colors to harmonize with room surroundings, and afford maximum heating efficiency. Four sizes available for apartments, offices, schools, homes. Vented installation is recommended, but they are A.G.A. approved either with or without.

For anything in GAS heating write

PAYNE FURNACE & SUPPLY CO.
BEVERLY HILLS, CALIFORNIA

Air Conditioning Booklet Issued For Public Distribution

The Minneapolis-Honeywell Regulator Co. of Minneapolis, Minn., has brought from the presses an interesting booklet entitled "This Thing Called Air Conditioning." The publication deals in simple manner with factors governing all-year-round conditioning of air, primary requisites for successful conditioning, various systems and the importance of automatic control to proper operation; and is intended as a contribution toward clarifying misunderstandings and misconceptions about air conditioning which are current in the public mind.

Gas Industry Bills Lie Dormant In Texas Legislature

Sessions of the Texas Legislature were adjourned early in May without any action being taken on the common carrier pipe line bill, Governor Allred's 60-million dollar state pipe line projects to St. Louis, Mo. and Detroit, Mich., or the anti-merchandising bill, all of which were up for consideration in the current session.

REFRACTORIES

GENERAL CERAMICS COMPANY
• REFRACTORIES •

For Conversion Burners, Circulating Heaters, etc.

Because they are uniformly accurate, strong, and dependable in every way, General Ceramics Refractories are used by most of the leading manufacturers of gas heating appliances. • Our engineers will gladly cooperate with you.

General Ceramics Company, 30 Rockefeller Plaza, New York

"MODERNIZE as you repair"

THE SPRAGUE METER COMPANY

BRIDGEPORT, CONN.

Los Angeles, Calif. San Francisco, Calif.

Davenport, Iowa. Houston, Texas.

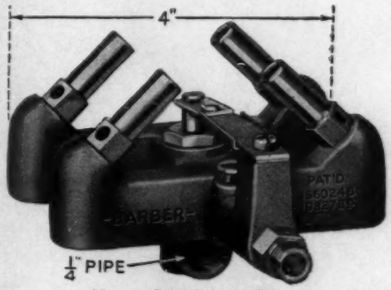
BARBER'S NEW REVISED PRICE SHEET

Showing Reductions Upon—

BARBER BURNER UNITS
BURNER AND PILOT JETS
GAS VALVES AND FITTINGS
GAS PRESSURE REGULATORS

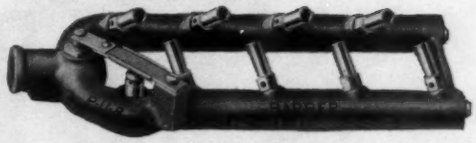
Will Stimulate Appliance Sales

These Net prices, after discount, of the New Patented Barber Units with Safety Pilots are no higher than those of good Safety Pilot Controls alone—and remember Hot Water Heaters must be equipped with Safety Pilots after July 1st, if A. G. A. Testing Laboratory Approval Requirements are observed.

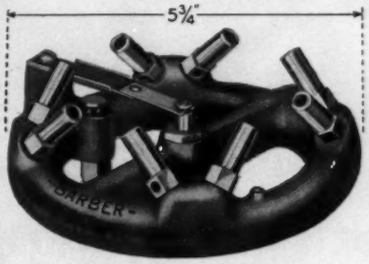


No. A. P-10 Barber Burner

There are over 40 different Standard Models and Sizes of Barber Burner Units, with Safety Pilot Control, of various capacities and 54 without Safety Control. There surely is a specific type for your appliance.



No. P.U-80 Barber Burner



No. S.P-15 Barber Burner

No Gas Appliance is better than its Burner—and without the proper Burner no Appliance stands present day rigid tes's. That's why leading Manufacturers have adopted Barber Burners with Safety Pilot Control.

Large users of Gas Pressure Regulators have switched to BARBER, after making comparative laboratory pressure drop tests and being convinced that no other make will show as low pressure drop. Their precise machining, assembly, bronze bodies, compactness, and their attractive prices are appealing.

Gas Pressure Regulator

Write today for these New Revised Prices and Discounts. Let us have your Gas Burner problems so that we may aid you in creating satisfied customers.

THE BARBER GAS BURNER CO.

3704 SUPERIOR AVE. CLEVELAND, OHIO

D F C Gas Boiler Burner—Series C

Operates with minimum excess air without pulsation.

Patented design creates uniform distribution of air across ALL mixing tunnels.

Exceptionally high capacity in proportion to frontal area.

Suited to either hand or automatic control.

Complete details, Bulletin 306

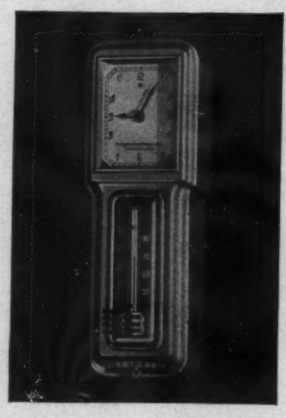
THE DENVER FIRE CLAY COMPANY
DENVER DFC COLO. U.S.A.
BRANCHES AT SALT LAKE CITY, EL PASO, AND NEW YORK

SATISFIED CUSTOMERS

■ Keep your customers satisfied by recommending and installing the Chronotherm*... the greatest achievement in the field of automatic heating. It provides unvarying temperatures and will entirely eliminate "Cold 70°", and save fuel by doing so. Minneapolis-Honeywell Regulator Co., 401 East 28th Street, Minneapolis, Minn.

■

MINNEAPOLIS-HONEYWELL
Control Systems



The Chronotherm*... Provides absolute unvarying temperatures and eliminates "Cold 70°".
* *Formerly called Thermochron.*

The Goodman Stopper

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, N. Y.

Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street
San Francisco, California

The Washington Plan

(Continued from Page 14)

It is believed that the adoption in any community of this plan of rate adjustment will result in a maximum of good-will and the elimination of much of the cause of the present unrest.

Does it make any difference whether valuations are made according to the reproduction cost theory or the prudent investment plan followed in Massachusetts?

This plan can be applied to a valuation found by any method.

Is it necessary, when adopting this plan to have a formal valuation made, by appraisal companies?

Obviously, it is essential that care be used in determining the basic valuation and at least an inventory of the property involved must be made, but a formal valuation is not necessary provided the company and the authorities can agree on what the valuation is to be.

Must a revaluation be made each year when the new rate is worked out?

The original valuation is brought down to date each year by adding the net additions and betterment costs. A complete revaluation of all the property would only be needed when there has occurred a drastic change in labor and material values. If prudent investment valuation is used, the initial valuation is the final one, except of course, for the annual additions and retirements of plant, at cost.

Will this plan have the endorsement of the Administration in its fight to adjust utility rates?

In a recent report to Congress the Federal Trade Commission said, in part, "There might well exist a public policy which allowed to the utility a proportion of the increased earnings from efficiency and to the public the remainder of it in the form of reduced rates."

What effect might the plan have on the market for securities of companies using it?

The opportunity for stabilizing the base rate of return and for benefiting by economies should add value to the securities and cause them to have a ready market at reasonable rates of return.

Does this plan fix, limit, or control dividends?

It does not consider in any way, the dividends to be paid. The directors are free to retain or pay out dividends as they see fit. As the earnings in a profitable, well managed company will, under this plan, nearly always exceed the base rate of return, the directors may decide to pay out fluctuating dividends absorbing available dividends of each year; or a uniform dividend, accumulating a dividend reserve to be drawn on in difficult years, when for special reasons net income does not provide base rate earnings, or even enough for the regular dividend.

Does the utility company actually give anything back to the consumers?

Not exactly. The workings of the plan, perhaps may be best explained by a few figures. Let us suppose that a company is allowed to earn a return of 6 per cent on its valuation, requiring $600,000 as net earnings. In the year just closed the earnings have been $800,000. During January a new rate schedule is worked out or adjustments made to the present schedule which will reduce the cost to consumers during the coming year, on the same consumption, by $100,000; this rate is referred to the authorities for approval and if no objection is raised it is applied to the January meter readings.

Note that the company does not return any of the $200,000 of excess earnings. It retains them all and simply lowers the rates for the coming year. If there should be no increase in business and no change in operating expenses during the year, the excess earnings would be $100,000 and a new rate the following year would offer savings of $50,000. If there should be a poor year with a slump in business or higher operating costs and no excess earnings be made, then the rate would not be altered. But in each case the excess earnings once received are fully retained by the company. In some companies they might offer a substantial source of new capital for extensions and improvements without the sale of new securities.

What happens if the rates do not yield the standard return?

In Washington the agreement provides that after varying delays dependent on the amount earned, a failure to secure the standard rate of return is corrected by an increase in rates.

Has the plan been successful in Washington and acceptable to company and consumers?

It has been in use 10 years. The earnings under the plan have been sufficient to permit the company to offer lower rates each year including 1935.

Republic Steel Corp. Appoints Salt Lake City Sales Representative

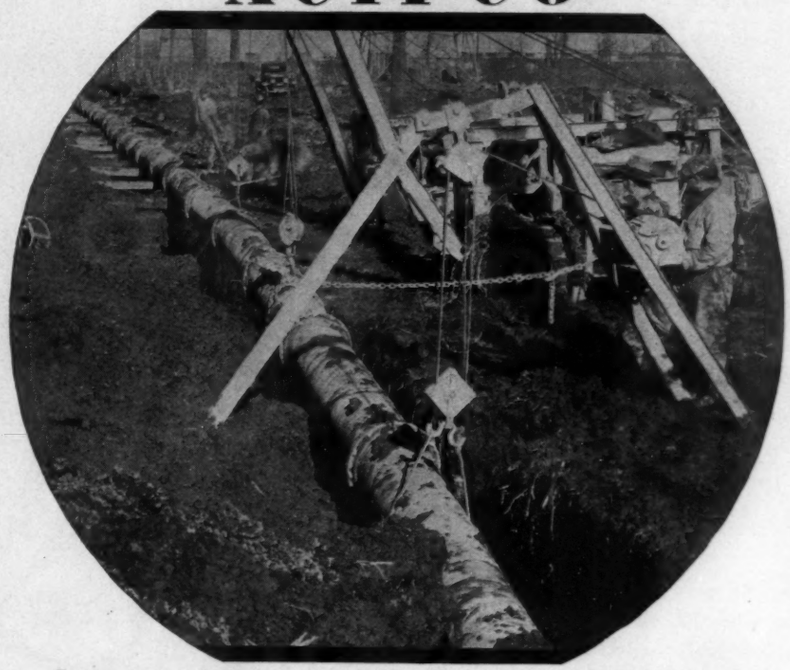
Lee Wright has been appointed sales representative for Republic Steel Corp., with headquarters at 401 Atlas Bldg., Salt Lake City, Utah, according to an announcement by N. J. Clarke, vice-president in charge of sales for the company. Prior to his new appointment Mr. Wright was associated, since 1902, with Zion's Co-operative Mercantile Institution of Salt Lake City.

The Salt Lake City territory in the past has been handled through the Denver office of Republic Steel Corp.

Jos. W. Hicks Honored

Joseph W. Hicks, publicity director of Byllesby Engineering and Management Corp., Chicago, Ill., has been elected president of the Chicago Alumni Chapter of Sigma Delta Chi, national honorary journalistic fraternity.

"ACIPCO"



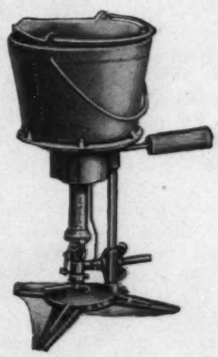
Lowering a long string of 18″ Mono-Cast Doublex Simplex Centrifugal Pipe into a trench partly filled with water. Note ease and simplicity of this operation, despite mucky terrain. The Doublex Simplex Joint is bottle-tight for any pressure (gas or liquid) from 0 to 1000 pounds. For literature write American Cast Iron Pipe Co., Birmingham, Ala.

PEERLESS
RADIANT GAS HEATERS

Attractive
Efficient
Economical
Sturdy
Guaranteed

A. G. A. Approved

WRITE FOR DETAILS
PEERLESS MANUFACTURING CORP.
1400 W. ORMSBY
LOUISVILLE, KENTUCKY



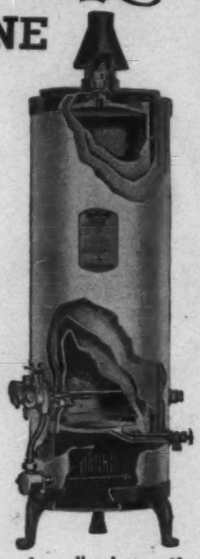
JOHNSON NO. 8 ADJUSTABLE TORCH AND MELTING POT

Here's an inexpensive unit which renders a number of essential services. Heats soldering coppers, melts soft metals, and may be used for tempering and pre-heating small tools and parts. Adjustable burner may be removed and used as hand torch. Write for full details.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Western Representative:
C. B. BABCOCK CO.
135 Bluxome Street
San Francisco, Calif.

Eastern Representative:
J. H. McPHERSON
250 Stuart Street
Boston, Mass.

Welsbach
HOTZONE
Self-action storage gas water heaters
Approved by A. G. A. Laboratory

Heaters are made in all domestic sizes with 300 lb. test galvanized or Everdur tank.
Write for Details
WELSBACH COMPANY
Gloucester City, N. J.
SAN FRANCISCO, CALIF. CHICAGO, ILL.

FRASER
Radiant Front Console
Equipped with Fan

Velgrain Finish
The heater that smiles while it warms
Manufactured by
Fraser Furnace Company
Stockton, California
Distributed by
H. R. Basford Company
San Francisco Los Angeles

Installation of 20 Fluor air cooled mufflers on 760 h.p. gas engine, Ventura Ave. Field, Calif.

Induced Draft Type of Air-Cooled Exhausts Described

By J. S. Fluor, Jr.
The Fluor Corporation, Ltd.

THERE is considerable interest among those connected with compressor station operation in the principle of the air-cooled exhaust, and with this in mind the following description of the induced draft type is offered.

The exhaust pipe extending from the engine to the outside of the building is incased with another pipe sufficiently large to give 3 inches of space around the exhaust pipe. The outer pipe or air duct extends from a point about 12 inches from the exhaust stool to the outside of the building and upward to a point 5 to 8 feet above the eaves. The inner pipe or exhaust line is terminated 10 to 12 feet below the top of the air duct. The explosions from the engine give a jet action which induces a stream of air into the air duct at a point near the exhaust stool.

The cool air flowing along and around the outside of the exhaust pipe reduces the exhaust gas temperature several hundred degrees.

This arrangement can be used with or without a muffler.

A properly designed air-cooled exhaust, on a 200 H.P., 2-cycle gas engine, will draw from 1,000 to 1,500 cubic feet of air per minute. This means a complete change of air takes place within the building once every 5 minutes. This rapid movement of air will prevent the accumulation of large volumes of gas or vapor and unless gas is leaking into the compressor room in comparatively large volumes there is no danger of concentrations reaching the point of becoming an explosive mixture.

In starting a gas engine, there is usually a certain amount of unburnt gases that pass through the exhaust pipe to atmosphere. With the first ignition there is always the possibility of a backfire due to the presence of these gases. Since these gases are confined within the exhaust line, it is impossible for any flame to reach the room without first rupturing the exhaust pipe.

There is always present a natural air flow through the cooling ducts, due to a temperature differential between the inside and outside of the building, even when the engine is still. This flow is sufficient to carry off any small amount of dangerous gas that might accumulate in the ducts when the engine is not running. In fact, this flow will be increased by the presence of any lighter-than-air gas.

Any exhaust gases escaping from the exhaust stool or lines will be quickly eliminated by this type of exhaust. Although these gases are not particularly hazardous, they are annoying and detrimental to health.

The air ducts serve as a protection against burns to the operator while working around the engine.

The temperatures of engine foundation, floors and steel trench covers are only a few degrees higher than room temperatures, resulting in better operating conditions and preventing foot troubles. In some plants this is rather serious, since floor temperatures run as high as 140°F. to 150°F.

Some engineers desiring positive protection against explosive mixtures coming in contact with the hot exhaust pipes have installed the air-cooled exhausts, but a second air duct was used, permitting the air to be drawn in from the outside of the building. The main objection to this type is that it does not rid the building of gas or vapors. (This type is particularly desirable in colder climates where heating is necessary.)

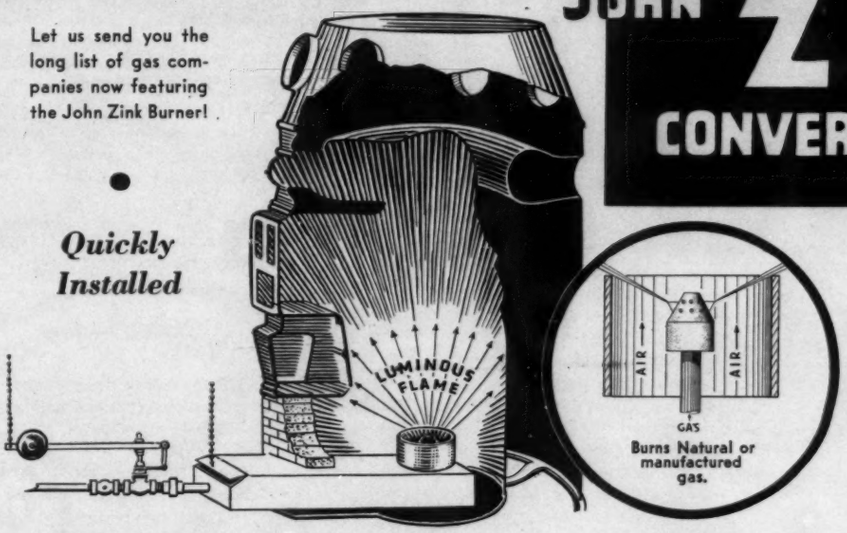
Starts Princeton Line

The Arkansas-Louisiana Gas Co., Shreveport, La., has begun construction of a 10-inch 9-mile natural gas pipe line from Sligo to Princeton, Bossier parish, La., at an approximate cost of $150,000. The line will connect with the 20-inch Shreveport-Monroe line at Princeton.

MULTIPLY YOUR HOME HEATING PROSPECTS WITH THE NEW JOHN ZINK CONVERSION BURNER

Let us send you the long list of gas companies now featuring the John Zink Burner!

Quickly Installed



The new John Zink Burner gives the Gas Industry its long-awaited answer to the question, "How shall we sell Gas Heat to the Small-home owner and the renter?" Look at our price to Gas Company Dealers:

Burner	$8.50
Chain Control Accessories	4.00
Baltimore Automatic Cut-Off	8.50
	$21.00

(Thermostatic Equipment Extra)

CHAIN-CONTROLLED FROM THE LIVING ROOM OR FULLY AUTOMATIC WITH CUSTOMARY CONTROLS

Furnished Complete at a SENSATIONALLY LOW PRICE

Now—Sell the John Zink Burner at cost—at a small profit—or install it as you do your meters, and BUILD LOAD! Let us show you—write to:

JOHN ZINK BURNERS
TULSA, OKLAHOMA

SEND US your recalibration work *and save several weeks' time*

Bristol's West Coast Service Laboratory and Assembly Plant

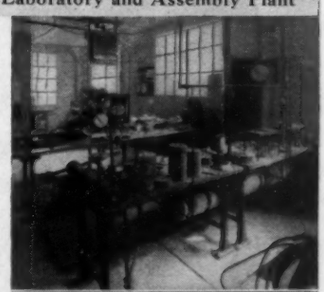
Perhaps you, too, have on hand a number of old Bristol's Recorders that now, after a long period of fine service, need reconditioning. Or that should be modernized in order to measure under the different conditions and within the different ranges your processes today require.

If so, send them direct to us. Don't think of going to the expense and delay of having this work done several thousand miles away.

Pack recorders carefully and ship to 311 Minna St., San Francisco. Mail order authorizing work to nearest office.

THE BRISTOL COMPANY

Branch Offices: Rialto Bldg., San Francisco..747 Warehouse St., Los Angeles..Branch Factory: 311 Minna Street, San Francisco.



BRISTOL'S

TRADE MARK REG. U.S. PAT. OFF.

PIONEERS IN PROCESS CONTROL SINCE 1889

RECONDITIONING

Illustrated above is the first reconditioning job with NO-OX-ID. This line had been in service seven years. **The coating of NO-OX-ID extended the life of this line eleven years without a leak.**

NO-OX-ID is simple to use and most effective in results. It kills the pitting chemically. Combinations have been developed to meet all conditions of corrosion and soil action.

NO-OX-ID lends itself to every reconditioning problem.

DEARBORN CHEMICAL COMPANY
LOS ANGELES
807 Mateo Street, Phone TRinity 3385
SAN FRANCISCO
421 Bryant St. Phone SUtter 8688

NO-OX-ID
IRON RUST
The Original Rust Preventive

Engineering Data for Rate Case Valuation

(Continued from Page 11)

treated by both commissions and courts. The difficulty has been largely due to the fact that the historical data on plants meant little or nothing. In fact it seems the records were often designed to hide rather than to disclose the history in this matter. If such records can be analyzed to describe and substantiate actual costs, including rational allowances for promotion fees, it would be well to have the data ready, for when historical data is lacking commissions have a ready excuse to curtail this item.

Cost of Financing represents a very real and substantial cost in the development of a property. It is in most records so interwoven with Preliminary and Organization Expense and Legal and Administration Expense During Construction that it can not be separated from them and the historical value of all three items is thus impaired. Under standard classifications of accounts that portion of Cost of Financing having to do with long term debt (Bond discount and expense) is set up to be amortized. That portion arising out of the equity stocks in commission hearings usually gets scant attention because it can not be substantiated from the history of the company. If financing has been largely done by equity stocks instead of bonds this item of value, and often of substantial actual cost, is then lost to the company. In many cases if time were available it might be built up from records.

Business Development Cost

A lag between the completion of construction and development of business is inherent in the gas industry. The deficiency, under normal rate of development under good management and good operation on a sound enterprise, of earning a fair return during the development period, is the cost of business development. As such it is a measure of Going Concern Value. It has been frequently disallowed by commissions because cost has not been shown to have been actually borne in the development of the property under consideration even though it had been shown to be inevitable upon reproduction. Data may be accumulated on the rate of business development, both as to customers and customer use, on the additions to property which will be a valid measure of what would occur under reproduction and at the same time answer the question as to what has occurred on the particular property.

Replacements, Abondonments

The expenditure for replacements and abandonments of property made at a period so remote that labor and material prices have meanwhile fluctuated will not bear the relationship to property value of today that it bore to values existing when made and hence cannot establish the ratios of today. If records are available which show in detail the property abandoned or replaced and the condition of salvaged equipment, a present day ratio may be established and a future ratio predicted. The records of these costs must then be analyzed on the basis of items, not of values, and correlated as to the life of such items to establish the present and future requirements for depreciation reserve account. Only if a system be of sufficient age that replacements and abandonments have reached a stable rate do the actual costs of replacements and abandonments form a guide as to the required accrual rate over the life of the property.

MODERN
EFFICIENT

Safe
Quick
Positive!

Pacific Forced Air Unit Heater *Illustrated*

PACIFIC'S *Complete* LINE of Gas Appliances Include:

- Floor Furnaces • Cabinet Heaters
- Wall Heaters • Gas Steam Radiators
- Radiant Heaters • Water Heaters
- Gravity Furnaces • Forced Air Furnaces • Unit Heaters

Write for complete information on any or all items

Pacific Gas Radiator Co.
Main Office and Factory
Huntington Park, California
Oldest and Largest Manufacturer of Gas Heating Appliances in the West

Nordensson Joins Roberts-Gordon Industrial Department

C. O. Nordensson, widely-known authority on industrial gas applications, and for many years general manager of the Lee B. Mettler Co., has joined the Roberts-Gordon Appliance Corp. of Buffalo, N. Y., where he will head the company's industrial gas burner activities.

Mr. Nordensson entered the gas industry in 1903 and since that time has had a wide experience in the application of gas to industrial uses. He was at one time connected with the Westinghouse and later with the Fairbanks-Morse companies.

During the St. Louis World's Fair he was in charge of the gas producer division of the Government's coal testing plant where clean producer gas was made from soft coal and utilized for producing power in comparison with the use of coal under a steam boiler.

He was formerly general manager of the Gas Combustion Co., of Pittsburgh, Pa., makers of blast furnace gas burners. He is the inventor of the Duquesne burner, which was the first multi-unit low-pressure burner manufactured and sold by the Duquesne Burner Service Co., of which he was also general manager.

Mr. Nordensson was born in Sweden and received his mechanical engineering training in that country, coming to the United States in 1902.

A. V. Grief in Executive Post for Gary Utility

A. V. Grief, widely-known in automotive financial circles, has been elected vice-president, secretary and treasurer of the Gary, (Ind.) Heat, Light & Water Co. Since April Mr. Grief has acted as financial adviser to A. C. Colby, president of the company.

Mr. Grief formerly was with the Industrial Acceptance Corp. in South Bend, later going to New York to become a foreign representative of the corporation. Following that service, he joined the Pierce-Arrow Sales Corp. in New York, serving as its vice-president and treasurer. He later was made assistant to the president of the Pierce-Arrow Co. with headquarters in Buffalo, and held that post until he resigned to join the Gary utility.

DIRECTORY

Byllesby Engineering and Management Corporation

Wholly-owned subsidiary of Standard Gas and Electric Company

231 South La Salle Street, Chicago
New York Pittsburgh San Francisco

• HYDRAUGER •
MODERN HORIZONTAL BORING MACHINE
For Underground Installation of Pipe and Conduits. Avoids damage to costly pavements and saves time. Send for Bulletin.
HYDRAUGER CORPORATION, Ltd.
116 New Montgomery St. • San Francisco, California

DISTRIBUTORS WANTED:
for *NEMEC* Combustion Equipment
Burners and Controls for Every Requirement
NEMEC COMBUSTION ENGINEERS
Whittier, Calif.

SUBSCRIPTION ORDER BLANK

WESTERN GAS

810 So. Spring St.,
Los Angeles, Calif.

Gentlemen: Starting with the next monthly issue, you may send WESTERN GAS to the undersigned. Upon receipt of your invoice, remittance will be sent to cover (1 year $2.00) or (2 years $3.00). Other than U. S. $3.00 per year.

Name .....

Title .....

Company .....

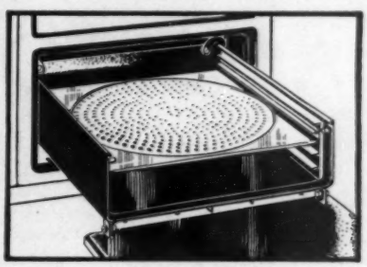
Address .....

City and State .....

Date .....

WEDGEWOOD'S NEW COOKING PRINCIPLES!

Patented ASTOGRIL BROILER



This latest type broiler consists of a thick cast aluminum grill and circular reservoir within a roller-bearing mounted pull-out drawer. The grill is preheated and sears on both sides simultaneously to seal in juices and improve flavors. It broils small pieces like oysters, bacon, vegetables, etc. that would fall through a grated type broiler. It is convenient to use and very easy to clean. Makes broiling the better and healthier way of cooking.

SPEED *plus* SIMMER BURNERS

A 2-in-1 aluminum burner operated by a single gas valve. The entire burner or the simmer flames can be used alone as desired. Without using special utensils the simmer flames make waterless or semi-waterless cooking possible on every top burner! This method of cooking is healthier, tastier, more convenient. Avoids excessive steam and odors in the kitchen—pots do not boil dry or scorch. Descriptive folder mailed on request.

JAS. GRAHAM MFG. CO.
San Francisco, Los Angeles and Newark, Calif. • Portland, Oregon
OVER 1,000,000 SATISFIED USERS IN THE WEST

Testing a floor furnace for fire hazard at Pacific Coast Branch A.G.A. Testing Laboratory.

New Tests on Floor Furnaces By A. G. A. Laboratories

IN LINE with the policy of the American Gas Association to strengthen and improve test requirements on appliances as rapidly as such improvements are warranted, the requirements on floor furnaces have been materially changed. These changes consist of: (1) an increase in the efficiency, (2) practical tests for elimination of the hazard of fire from overhead grilles or furnace walls, (3) a limitation has been placed on the outlet air temperature, and (4) a pressure regulator insuring constant gas pressure on the burners is made mandatory. All of these new requirements will have a tendency to improve floor furnace construction and performance. A typical test set-up for testing the temperature of the grille and sides of a floor furnace where they may contact the wood flooring or joists is shown in the illustration. Note the thermocouples attached to the grille and the thermometers extending through the wood joists contacting the sides of the floor furnace. Several floor furnaces have passed these rigid tests at the Pacific Coast Branch Laboratory in Los Angeles, since the new requirements became effective on January 1 of this year.

A FULTON *is at Home*

in the Most Modern Service

Where the most advanced methods and the most highly specialized equipment are used, and where the most precise and unfailing control of pressures is required, in any department of industry, Chaplin-Fulton Regulators will be found at work. For more than forty years, they have been used with success and satisfaction, new design and new technique of manufacture being always adjusted to meet new conditions or new demands. So now more than ever they are recognized as standard equipment.

The regulators here seen are in operation in a flowing plant of an active Oklahoma oil field.

Correspondence regarding any special need of pressure control will be given careful attention.

The Chaplin-Fulton Manufacturing Co.
28-40 Penn Ave., Pittsburgh, Pa.

Small Home Burner by John Zink on Market

A GAS burner designed especially for the small income home has been perfected and is now in production, according to John Zink, head of John Zink Burners, Tulsa, Okla.

According to the manufacturer the John Zink Burner embodies new principles in the burner field, and fits the budget of the small-income home in two ways: by selling at a price range considerably under the average cost, and by the application of a chain control in place of the automatic control if such is desired for reasons of economy.

The burner has an operating range of from 3 to 250 cu. ft. per hour and burns either natural or manufactured gas with a luminous flame, requiring no secondary air. Eighteen impinging jets at the burner head project the gas to form a thin sheet of gas flame that clears the top of the burner stack. The flame does not touch the furnace sides, hence the furnace requires no lining. Absence of lining increases the efficiency of the furnace 10 to 15 per cent over the usual application by actual tests, according to the manufacturer.

The John Zink burner acts as its own pilot, and a Baltimore cut-off valve, built into the burner, thus serves to cut off both pilot and burner in case of emergency. A simple limiting orifice devised by Mr. Zink replaces the usual regulator.

The sales program for the John Zink Burner includes plans for a merchandising service to gas companies who feature the new product.

Minneapolis-Honeywell Celebrates 50th Anniversary With Acratherm

The Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., on the occasion of its 50th anniversary, recently introduced to the gas industry a new temperature control product called the Acratherm. This latest development of the company has been styled by Henry Dreyfuss and is modernistic in design. It is small, approximately 2 inches wide and 4½ inches deep, and is available with or without the heat acceleration principle.

Among the mechanical features introduced in the new product is a detachable wall plate to which wiring connections are made after the plate has been screwed to the wall; the mounting of the thermometer underneath the cover; the provision of a large expansion well in the thermometer to safeguard against breakage due to high temperature; and the locking of the indicator dial to eliminate tampering.

The Acratherm is available in two models, the Type T10 which is the standard Series 10 device, and the Type T11 which incorporates the heat acceleration feature in addition to the Series 10 circuit. The heater arrangement of the Type T11 may be transformed to the Type T10 by removing the heater and discarding three parts.

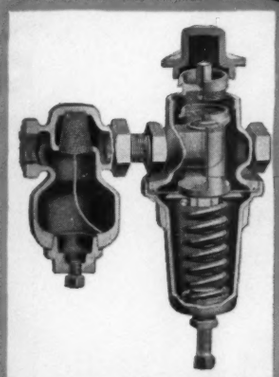
"Safe Enough" WON'T DO!

WHEN it comes to protection of life and property there can be no "border line cases"—no compromises. Always the vital spot in domestic hot water systems, pressure and temperature relief has become still more vital now that oil burners, gas burners and electric heaters are producing quick concentrated heat with corresponding quick pressure and temperature rises.

With these new conditions in mind the Mueller line—always known for its faithful performance—has been made still more dependable by new features of design and construction. The basic design of Mueller Relief Valves—an unduplicated and patent feature—is illustrated above. Note that the load of the heavy diaphragm spring is not carried by the seatage, but is carried by lugs in the valve body. The only spring pressure on the seat is that exerted by the light *auxiliary* spring which is used only for initial seating. Such a valve does not stick even when inoperative for long periods.

This is the golden thread through all Mueller Relief Valves. It assures a *positive relief*—within 5% of the pressure at which the valve is set—a degree of sensitiveness hitherto unknown. The value of this feature is further heightened by the larger diaphragms, finer construction, and countless expressions of Mueller engineering skill and manufacturing standards.

Yes, absolute safety is a *duty*. And we believe that careful inspection of the Mueller line will convince you that Mueller equipment is the fulfillment of that duty.



H-9000

Reducing and Regulating Valve—sizes ¼" to 2½", inc. Reduces any initial pressure up to 250 lbs. to any required delivery from 5 to 125 lbs. (The H-9000 acts as a check and therefore calls for a relief valve with it).

H-9045

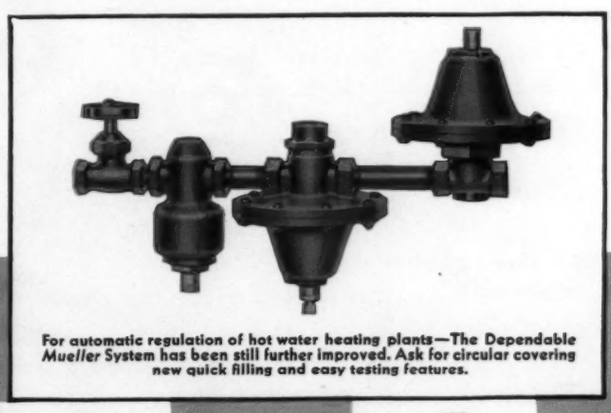
Relief Valve for hot or cold water, air or oil—½ inch size—for any specified relief from 5 to 160 lbs. Note the auxiliary spring seating—a patent feature now used in all Mueller Relief Valves.

●

Mueller Valves with testing device conform to the A. S. M. E. Boiler Code and are approved by Underwriters and Boiler Insurance Companies. Special patent features. Stocked by your heating and plumbing supply jobber.

H-9055

Combined Check and Relief Valve. Contains H-9045 unit, and has new vertical type of check plunger which provides wider opening through valve. Sizes ½" and ¾"—any relief from 5 to 160 lbs.



For automatic regulation of hot water heating plants—The Dependable *Mueller* System has been still further improved. Ask for circular covering new quick filling and easy testing features.

Write for NEW BULLETIN

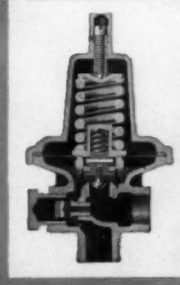
A new bulletin covering pressure and temperature relief and regulation is now on the press. It covers the subject exhaustively. Let us place your name on the list of those who are to receive the first copies.

MUELLER CO., Decatur, Illinois

Factories: Decatur, Ill.; Chattanooga, Tenn. Los Angeles, Calif.; Sarnia, Ont.
Branches: New York and San Francisco

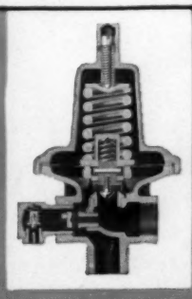
H-9047

Relief Valve (*Left*)—½ inch size. Has manual lifting device as required by several cities and states. Any specified relief from 5 to 160 lbs.



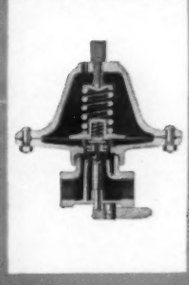
H-9165

Pressure and Temperature Relief Valve (*Left*)—Contains fusible plug which is made to fuse at a temperature of 212 degrees or less. ½" size.



H-9170

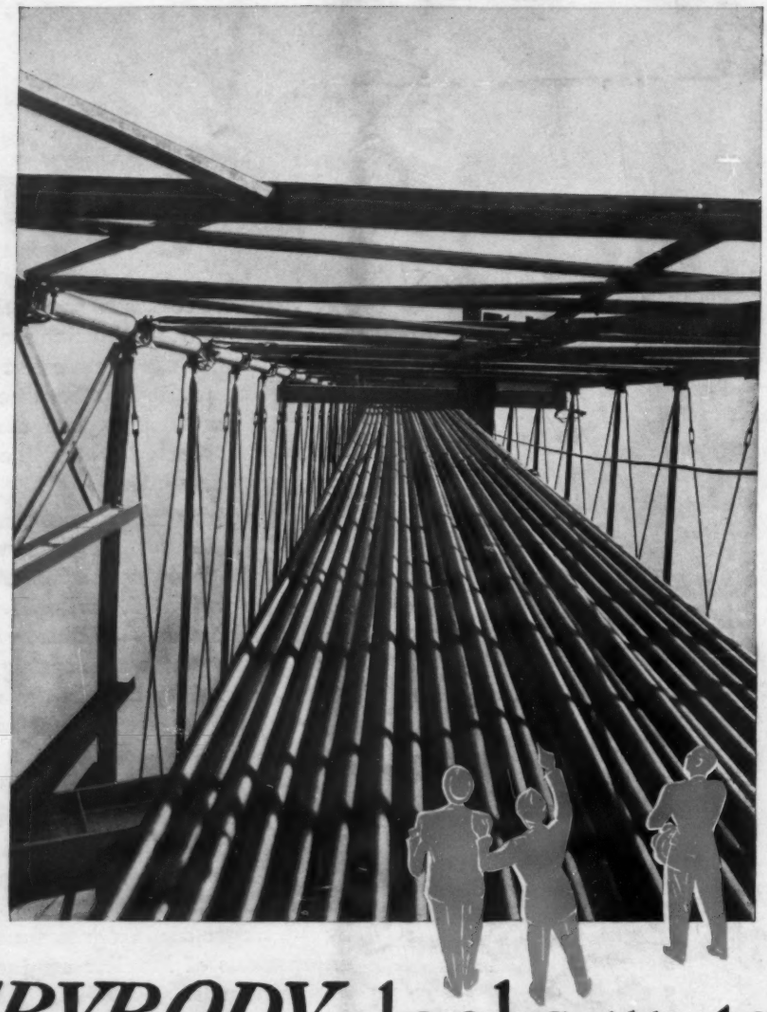
Pressure Temperature and Vacuum Relief Valve (*Left*)—Same as H-9165 but with added vacuum relief.



H-9052

Relief Valve with Testing Lever—for larger boilers. Sizes ½" to 2". Relief pressures 5 to 150 lbs.

MUELLER Valve SPECIALTIES



EVERYBODY looks up to

No improvement in pipe making since the appearance of the first metal pipe made from old gun barrels has marked such a forward step as the development of Republic Electric Weld Casing and Tubing.

Everybody looks up to these better tubular products because of their performance. That's why you see Republic Electric Weld Casing and Tubing in every active field.

REPUBLIC
ELECTRIC WELD
CASING·TUBING

Uniformity of wall thickness, perfect roundness, high yield point, straightness, freedom from scale and strength of weld as great as the strength of the wall—these are the features that make these products acceptable everywhere.

A new book on Setting Depths and Bursting Pressures will be sent to you upon request. Use the coupon.

Republic Steel
CORPORATION
GENERAL OFFICES · · · YOUNGSTOWN, OHIO

REPUBLIC STEEL CORPORATION, Youngstown, Ohio
Please send a copy of your new handbook giving setting depths and bursting pressures of Republic Electric Weld Casing.
Company----------
Individual----------
Address----------

SEP 0196